# Studies in
# Income and Wealth

VOLUME TEN

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IN INCOME AND WEALTH

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# PREFACE

THE PROGRAM of the Conference on Research in Income and Wealth held in November 1945 reflects certain developments that would not have been possible without the conceptual and statistical basis laid in preceding years.

The existing (admittedly incomplete) agreement on general conceptual principles has proved fruitful in preparing the ground for international comparisons. The results of discussions between American, British, and Canadian statisticians on the possibilities of standardizing the basic concepts of national bookkeeping were reported in the paper that opens the volume. A large measure of agreement on concepts was reached by persons engaged in the official compilation of national income in the three countries. Naturally, the agreement on the set of 'exhibits' had to be in the nature of a practical compromise. Consequently, it does not imply that the individual workers believe the best way of defining national income has been found or that the 'exhibits' are the best ways of itemizing it. A number of purely definitorial questions remain unanswered — such as that of the income of financial intermediaries, the subject of the second paper of Part I.

Yet, the degree of clarity achieved so far makes it in many cases possible to compare various estimates of national income or of its components: by properly rearranging or completing the list of items a meaningful result can be obtained for any desired system of definitions of national bookkeeping items, provided the system is logically consistent. There remains, of course, the question whether a given system of definitions is practicable, i.e., lends itself to feasible computations on the basis of existing data; and whether it is likely to prove useful for purposes of economic study or economic policy.

Logical and practical difficulties of international comparison become apparent in Part III. The first paper deals not only with definitions of the component items but also with the delicate problem of comparing figures in different currency units, especially as reflected in some British-American comparisons which had to be made during the war. This paper is followed by one on the National Income Estimates of Latin-American Countries.

Part II tells of attempts to use past figures of national bookkeeping to estimate in advance the nation's aggregate demand for goods and services and its level of unemployment when certain values are assigned to other magnitudes, such as the government's fiscal policy, the available labor force and its potential productivity, and, in some cases, private investment activities.

Earlier attempts to measure the distribution of income by size have been related, in Part IV, to measurements of the behavior of individual families, and in particular to their annual savings. Savings and the Income Distribution tests an important hypothesis on the attitude of savers; the other paper discusses the use of alternative classification principles such as, especially, the income and the total expenditures of a family.

The Executive Committee for 1945–46 (O. C. Stine, Chairman) organized and carried through the program of this Conference. The editing of the volume was supervised by a Committee consisting of Edward F. Denison, Chairman, Selma Goldsmith, and Simon Kuznets. As in the past, Martha Anderson gave her services as editor.

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## *Relation of the Directors to the Work and Publications of the National Bureau of Economic Research*

1. The object of the National Bureau of Economic Research is to ascertain and to present to the public important economic facts and their interpretation in a scientific and impartial manner. The Board of Directors is charged with the responsibility of ensuring that the work of the National Bureau is carried on in strict conformity with this object.

2. To this end the Board of Directors shall appoint one or more Directors of Research.

3. The Director or Directors of Research shall submit to the members of the Board, or to its Executive Committee, for their formal adoption, all specific proposals concerning researches to be instituted.

4. No report shall be published until the Director or Directors of Research shall have submitted to the Board a summary drawing attention to the character of the data and their utilization in the report, the nature and treatment of the problems involved, the main conclusions and such other information as in their opinion would serve to determine the suitability of the report for publication in accordance with the principles of the Bureau.

5. A copy of any manuscript proposed for publication shall also be submitted to each member of the Board. For each manuscript to be so submitted a special committee shall be appointed by the President, or at his designation by the Executive Director, consisting of three Directors selected as nearly as may be one from each general division of the Board. The names of the special manuscript committee shall be stated to each Director when the summary and report described in paragraph (4) are sent to him. It shall be the duty of each member of the committee to read the manuscript. If each member of the special committee signifies his approval within thirty days, the manuscript may be published. If each member of the special committee has not signified his approval within thirty days of the transmittal of the report and manuscript, the Director of Research shall then notify each member of the Board, requesting approval or disapproval of publication, and thirty additional days shall be granted for this purpose. The manuscript shall then not be published unless at least a majority of the entire Board and a two-thirds majority of those members of the Board who shall have voted on the proposal within the time fixed for the receipt of votes on the publication proposed shall have approved.

6. No manuscript may be published, though approved by each member of the special committee, until forty-five days have elapsed from the transmittal of the summary and report. The interval is allowed for the receipt of any memorandum of dissent or reservation, together with a brief statement of his reasons, that any member may wish to express; and such memorandum of dissent or reservation shall be published with the manuscript if he so desires. Publication does not, however, imply that each member of the Board has read the manuscript, or that either members of the Board in general, or of the special committee, have passed upon its validity in every detail.

7. A copy of this resolution shall, unless otherwise determined by the Board, be printed in each copy of every National Bureau Book.

*(Resolution adopted October 25, 1926 and revised February 6, 1933 and February 24, 1941)*

# Part I

# Proposed Changes in the Measurement of National Product by the Department of Commerce

## Report on Tripartite Discussions of National Income Measurement

Edward F. Denison
*National Income Division*
*Department of Commerce*

## National Income Originating in Financial Intermediaries

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*Hope College*

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### *REPLY*

Mr. Denison
Mr. Yntema

# REPORT ON TRIPARTITE DISCUSSIONS OF NATIONAL INCOME MEASUREMENT

EDWARD F. DENISON

IN SEPTEMBER 1944 representatives of the agencies preparing the official estimates of national income for the United Kingdom, Canada, and the United States met in Washington to exchange views on the more difficult problems of national income estimation and, if possible, to bring about uniformity in terminology and in the treatment of controversial items. The meetings were attended by Richard Stone of the United Kingdom Central Statistical Office, the late George Luxton of the Dominion Bureau of Statistics, and Milton Gilbert, Ernest Doblin, George Jaszi, Charles F. Schwartz, William H. Shaw, Dwight B. Yntema, and myself of the National Income Unit of the United States Department of Commerce.

The discussions were stimulating and led, partly through persuasion, partly through compromise, to substantial agreement on most of the principal matters at issue. Steps have been initiated in each country to implement these decisions by adjusting the published estimates. Uniformity in definition among these three major countries should greatly simplify the problems of the users of national income statistics. It is hoped that other countries may follow the treatment agreed upon.

It was originally intended that Messrs. Stone and Gilbert should prepare a joint paper describing the agreements and their underlying rationale, which, after submission to Mr. Luxton for comment, would be published. Pressure of other work

and geographical distance prevented preparation of this joint report, and Mr. Gilbert's trip to Japan forestalled his preparation of an individual report. Since the Department of Commerce proposed to issue revised estimates of national income embodying these decisions within six months, however, it seemed imperative to place them before the autumn 1945 meeting of the Income Conference, and I agreed on short notice to prepare this statement. It will be evident to the reader that this report is intended as a description of the decisions reached at the Washington meetings rather than a well-rounded discussion of national income concepts. Moreover, it was prepared from inadequate notes nearly a year after the Washington meetings. Doubtless other participants would not agree with all my interpretations of the decisions. In any event, nothing in this statement should be construed as binding on any of the three statistical agencies concerned.

## 1 Fundamental Purpose of National Income Statistics

In the view of the conferees, the fundamental purpose of assembling the body of data usually termed, rather loosely, 'national income statistics', is to present a set of accounts that portray in summary form transactions in the national economy and facilitate analysis of its structure and development. These social accounts should be a summary of the accounts of businesses, individuals, and government as they exist in actual practice, except that adjustments must be made for differences in accounting procedure, for the failure of actual accounts to reflect real decisions, and for the inadequacy or utter lack of actual accounts for a fraction of the economy.

This approach to national income statistics perhaps tends to minimize the importance to be attached to any single series, such as national income, and to emphasize the interrelations among various sectors of the economy and among different types of transaction. It may be contrasted in particular to the welfare approach to national income measurement, which seeks to obtain a unique series, fluctuations in which may be accepted as a measure of changes in economic welfare. The proposals, however, do not suggest the elimination of any data analysts may consider useful in the measurement of economic welfare.

It is recognized, furthermore, that certain aggregates appearing in the accounts, such as national income, income payments to individuals, and gross national product, have great analytical significance in themselves. Indeed, the greater part of the sessions was devoted to the discussion of their exact content. At the same time, recognition that the composition of any such series must involve dubious if not arbitrary decisions and that any adequate set of accounts must be sufficiently detailed to allow the consumer of the statistics to make such reasonable adjustments as he may believe appropriate eased the compromise of differences.

## 2 Setting Out the Accounts

It was agreed that six or seven basic accounts, or sets of tables, would meet at least the more pressing needs for national income statistics.

*A gross national product and national income account* — to show the value of the gross national product and its composition, by type of product, in as much detail as the source material permits, together with the items necessary to pass from gross national product to net national product and to national income. National income earned in production will also be presented in as much detail as possible by type of income and by industry. Supplementary data to be compiled include the number of persons engaged in production.

*An income and expenditure account for individuals* — to show at least income payments to individuals and their disposition among personal taxes, consumption expenditures, and savings. Ideally, these items would be presented also by income size classes and by whatever geographic division is appropriate to the country. In the United States income payments are currently available by states and it is expected that estimates of disposable income (income payments minus personal taxes) will in time become available by states.

*A consolidated profit and loss account for private industry* — to show, for private industry, the consolidated value of production divided at least among sales to individuals, to government, and abroad, and inventory change; and the factor costs, indirect taxes, and capital consumption incurred in this production. A

rudimentary form of this account, such as was given in the *Survey of Current Business*, April 1944, Table 4 of the article on national income, can be derived from the published American data but not at present from the British.

*A government account* — to contain government receipts and expenditures in some detail. In the expenditure series government expenditure for goods and services will, of course, be separate from transfer payments. The desirability and feasibility of dividing the government accounts between a capital and a current account was discussed at length but no agreement was reached. Lack of agreement on this fundamental is responsible for nearly all the remaining differences between the proposed methods of measuring national income and national product in the three countries concerned. No such division is planned in the United States statistics.

To the extent possible, government expenditures should be classified by type of service performed and by type of expenditure with respect to the durability of the article. This would make possible the addition of government expenditures to private expenditures by category.

*A savings account* — to show the sources and disposition of gross savings. Variants of such tables have been presented regularly in the British White Papers, and for the United States in the *Survey of Current Business*, April 1944. 'Individual' savings should be divided among savings of nonprofit organizations, life insurance companies, other institutions, and real individuals including unincorporated enterprises. There was disagreement about the feasibility, both conceptual and statistical, of dividing the savings of proprietors between 'business' and 'personal' savings; the Department of Commerce, which formerly attempted it, was definitely opposed to this division. Total savings of proprietors could be distinguished conceptually from savings of other individuals, though it would be difficult statistically. Such a split might help to meet the analytical needs for which the 'business' savings figure is desired.

*A foreign account* — in essence similar to the International Balance of Payments now prepared by the Department of Commerce, though certain changes may be desirable. This account was not given much attention at the meetings.

*An account for financial institutions* — considered desirable by Mr. Stone. As its nature and necessity are not clear to me, and the Department of Commerce does not plan its inclusion, I shall not attempt to discuss it.

Mr. Stone, while satisfied with this system of social accounts as an immediate goal, envisages a much more elaborate system as a final desideratum. He is preparing a manuscript presenting his views in full for publication by the League of Nations Committee of Statistical Experts.

I think it will be clear that preparation of the set of national accounts just described is no sudden innovation, but rather is a refinement and formalization of the sorts of tables found most useful in economic analysis and developed experimentally in Britain and the United States in the past few years. The war, in particular, has brought home to economists and government policy makers generally the value of a complete national budget as a most important tool in the formulation of national policy. Business has evinced much interest in such accounts in mapping plans for the postwar period now upon us.

## 3 Definitions of the Chief Series

The remainder of this report is concerned primarily with the first account, but some attention is devoted also to the second. The decisions reached on specific items, of course, have implications for the other accounts, whose content was not developed in detail at the Washington meetings.

The five principal aggregate series are defined as follows:

*Income payments to individuals* measures current income *received* from enterprises and government by individuals and quasi-individuals resident in, or temporarily absent from, the country.

*Private income before taxes* equals income payments to individuals plus savings of corporations measured before deduction of taxes on income.

*National income* measures the earnings accruing to residents for the participation in production of the factors of production they supply. 'Residents' include persons temporarily abroad. National income may be viewed also as a measure of the value of goods and services produced by the economy valued at factor

cost. National income is equal to income payments to individuals, minus government and business transfer payments, plus income accruing to governments, minus income paid but not accruing to individuals during the period, and plus income accruing but not paid to individuals during the period.

*Net national product* measures the value of goods and services produced in the private sector of the economy valued at market prices, after deduction of depreciation charges, plus government services valued at cost. In other words, it is the total value of currently produced goods and services flowing to government, to business for net capital formation, and to consumers. Net national product is equal to national income minus subsidies, plus business taxes, business transfer payments, and bad debt allowances. At least in the United States, net national product will also differ from national income by the increase in the value of inventories arising from price changes to the extent that this increase is included in national income and by the statistical discrepancy involved in independent estimates of the national income and the national product.

*Gross national product or gross national expenditure* measures the value of goods and services produced in the private sector of the economy valued at market prices, before the deduction of any allowance for the consumption of durable capital goods during the period, plus government services valued at cost. It is equal to net national product, plus current accounting allowances for depreciation, capital outlays charged to current expense, and allocations by insurance companies or self-insurers to reserves against claim payments for fire or other damage to business property (actual claim payments, if books are kept on a cash basis).

The exact wording of these definitions was not formally approved though the substantive meaning of each of the five series was agreed upon. Nevertheless, a report prepared by an interdepartmental committee of the Dominion Bureau of Statistics for limited circulation uses in its preliminary form the term 'net national income at market prices' to describe the series described here as 'net national product'. It is hoped that this difference in terminology can be eliminated before the Dominion's revised statistics are released. I shall have frequent occasion to refer to this useful Canadian document below.

## 4 Treatment of Specific Items

The formulation of a set of definitions leaves unanswered a host of questions concerning the treatment of specific items. Most of these relate to national income and to gross and net national product. Income payments to individuals and private income before taxes, though not simple notions — especially when calculated for periods shorter than a year — at least do not involve the concept of value of production or of factor income. Most of the theoretical problems in national income and product estimation arise from the difficulty of giving these concepts precision. They are associated chiefly with the measurement of the product of government, with the distinction between personal and business taxes, with the notion of capital consumption, or with the extent to which transactions not involving the transfer of money should be measured and included in the accounts. Some items involve more than one of these difficulties and could equally well be classified under different headings in the following discussion.

### A *Value of Governmental Services*

In general, governmental services are to be valued at the factor cost of furnishing them.[1] This is in conformity with the present practice of all three governments represented at the meetings.

Interest paid on the national debt will be classified as a transfer payment and excluded from national income and from gross and net national product. This decision, reached only after long discussion, is based on the contention that the government receives no service in return for its payment of interest; that is, that the privilege of not paying off the national debt cannot legitimately be considered a product; or, viewing the problem from the income side, that the funds lent to the national government are not used 'in production'.

Interest paid on the debt of government units other than the national government will be included in national income and

[1] Some analysts, viewing government as a consumer rather than a producer, observe that government purchases of commodities and services, including labor, are valued at market prices; hence, they suggest, the 'cost' method of valuing governmental services is not a departure from the market-price valuation of private production. If this is accepted, government need not be mentioned specifically in the definitions of gross and net national product. I have preferred the more customary terminology in order to distinguish our treatment clearly from that of Simon Kuznets.

net and gross national product in the United Kingdom and the United States. The rationale of this decision was not made entirely clear, but presumably it is assumed that the magnitude of the debt of these units bears a fairly close relation to the value of their physical assets, so that interest paid serves as a partial offset to the non-imputation of a return on government property. The argument that in this case interest represents a payment for services rendered by the lender is of course ruled out if consistency is to be maintained with the decision to exclude federal interest. Canada, according to present information, will exclude provincial and municipal interest for the same reason that federal interest is excluded.[2]

No imputation will be made for the value of services rendered by government-owned capital goods. Although formal agreement was reached on this point, it was only because some participants, who considered such imputation desirable, believed it statistically impossible to prepare an acceptable estimate.[3]

Depreciation on government property will not be estimated in the United States and Canada. In the United Kingdom it may be estimated and will presumably be added to gross national product. Thus, national income and net national product will be measured net of depreciation of government property in all three countries, while gross national product will include this item in the United Kingdom, but exclude it in the United States and Canada. Depreciation on government property can enter

[2] I cannot forbear noting my personal belief that the American decision on this point is indefensible, if federal interest is to be excluded. The assumption stated in the text is, in my opinion, patently wrong in the case of the United States. Although my personal preferences on certain other items are at variance with the decisions reached, I can in other cases at least find some force to the supporting arguments. (As of February 1946 the Department of Commerce had reversed this decision and determined to exclude all government interest from national income and product. See the reply by the author, below.)

[3] The text statement describes my understanding of the agreements reached at the meetings. However, the Dominion Bureau of Statistics, according to information received in March 1946, has now decided "to regard government debt interest as being divided into two parts. The assumption is that interest paid on debt incurred to finance existing real assets represents a current payment for productive services while interest paid on debt incurred for other purposes does not. Thus the former portion of government debt interest, which is measured by applying the current rate of interest on the long term debt of the government in question to the value of government property as carried in the balance sheets shown in the various public accounts, is included in national income. The latter portion is treated as a transfer payment and excluded."

gross national product accounts only if it is specifically estimated and added to governmental expenditures.

No estimates of changes in government inventories will be included in national income or product.

It is recognized that under conditions of compulsory military service any valuation placed on the services of the armed forces is essentially arbitrary, but it was decided to value their services as equal to their compensation. Compensation of the armed forces, as included in national income and gross and net national product, will be made up of cash pay, cash allowances including dependency allowances, and the value of food, clothing, and any other items of income in kind that can be measured reasonably well. Mustering-out pay, bonuses, and other deferred payments (e.g., payments under the United States 'G.I. Bill') might well be considered compensation for services, but since payment is made at a date far removed from the time the military service was performed, and a reallocation of these payments would be difficult and require continuous revision of the national income estimates for the war years, it was decided to treat these items as transfer payments. In each country special types of payment may require special decisions. In the United States, for example, the government contribution to the national life insurance fund will be included in national income, but the value of special tax privileges granted service men will be excluded.

No deduction from the value of governmental services will be made to eliminate indirect governmental services (governmental services to business). None of the participants believed such a distinction feasible, and some were not convinced of its necessity or desirability.

### B *Direct Versus Indirect Taxes*

The problem of distinguishing between direct personal and business taxes, on the one hand, and indirect business taxes, on the other, arises chiefly from the difficulty of determining whether the incidence of a tax rests on a particular factor income or is passed on to consumers or otherwise dispersed through the economy.[4] This determination does not affect gross

[4] Some investigators, including the Canadian authors of the report cited, have denied that the incidence criterion need be adopted, suggesting instead that business account-

or net national product, which are measured at market prices, but does affect the size of national income, which does not include indirect business taxes. Questions have been raised chiefly with respect to three types of tax, whose incidence is probably, in fact, mixed. The arguments on both sides have been so frequently debated that I shall confine myself to a statement of the decisions reached.

Taxes on corporate net income, including excess profits taxes, are direct taxes. Consequently, corporate profits before deduction of income and excess profits taxes will be included in national income.

Taxes levied on business property (including land and residential housing) are indirect taxes and excluded from national income.

Social insurance payroll taxes, whether levied on employer or employee, if counted as taxes at all, are direct taxes and included in national income. But social security payroll taxes may be viewed not as taxes but as income accruing to individuals, the time of payment differing from that of its accrual. In this formulation the government acts merely as the administrator of the fund. It is this latter statement that seems to correspond best to the general treatment of social insurance described below.

### C *Measurement of Capital Consumption and Inventory Change*

The inadequacy of accounting depreciation charges as a measure of capital consumption explains in part the popularity of the gross national product concept, which does not require data for capital consumption, and is the main reason why the Department of Commerce has been reluctant to issue a net national product series.

Nevertheless, it was decided that, at least for the present, no better measure of the consumption of durable capital goods by use and obsolescence is available and the accounting measure

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ing procedures will show whether a tax is direct or indirect. If taxes are treated as costs by business they should be treated as indirect. It seems to me, however, that this approach merely makes the accountant, instead of the investigator, the judge of incidence — and that without a clear understanding of what decision he is supposed to be making.

will be accepted. No proposal to revalue depreciation charges for price change was made. Along with depreciation charges, capital outlays charged to current expenses and provision for fire and similar damage to business property will be excluded from net national product and national income.[5]

It was agreed that an adjustment to all five basic series *should* be made to eliminate changes in the value of inventories due to changes in prices rather than to changes in the physical volume of inventories. But it is difficult, chiefly but not exclusively because of differences among firms in accounting procedure, to determine the extent to which such price changes affect the basic accounting data with which the estimator must work. Because of the impossibility of making an accurate adjustment of the accounting figures by industry and distributive share, only changes in farm inventories will be valued at constant prices in the three income series in the United States (changes in farm inventories can be valued this way in the first instance). In other industries accounting figures will be accepted. However, an over-all adjustment for the revaluation of nonfarm inventories will be made in gross and net national product. In the United Kingdom this adjustment will be included in the income as well as the product series. In Canada, it will not be made in either series, except for agriculture and for grain held in commercial channels.[6]

[5] This treatment of capital outlays charged to current expenses assumes that they equal depreciation charges on such outlays made in the past. A more exact treatment would add back such outlays to business profits into national income, deduct from profits an estimate of depreciation on capital goods charged to current account in the past, and add this estimate to the depreciation item used in reconciling net with gross national product; but this treatment is beset with even more statistical difficulties than that adopted.

Provision against damage to property (including residential housing) by fire, storm, automobile accident, etc., rather than actual loss sustained, is, in a general formulation, made the measure of capital consumption. It may be noted that not premiums, but allocations by insurance companies or self-insurers to reserves against claim payments for damage to business property (actual claim payments, if books are kept on a cash basis) measure protection against loss.

[6] Shortly before proof was received on this volume, the United States Department of Commerce decided to include the adjustment for revaluation of inventories in all its income series as well as in the national product. This decision was made, in the face of statistical difficulties, to avoid perpetuating an illogical difference between national income and national product. It is in line with the views expressed by several participants in this Conference in the discussion published below.

It was agreed that charges to reserves for depletion should not be deducted from national income, but should be added back into business profits. Correspondingly, they will not be deducted in computing net national product. For this, there is the conceptual reason that discovery of mineral resources is not counted as gross capital formation, so that allowance of depletion destroys the balance between capital formation and capital consumption; and there is the very important statistical reason, at least in the United States and Canada, that the tax laws governing accounting of this item are such as to give meaningless accounting figures. It was pointed out that if any genuine depreciation of actual development expenses was included in depletion charges it should be transferred to the depreciation account.

### D *Items of Noncash Income*

In general, to quote Kuznets, it is desired to include in the national income and product account transactions in "all goods appearing on the markets of the country (subject to restrictions imposed by other issues), whether exchanged for money or for other goods, plus the retained products of activities most of which result in marketable goods, plus the imputed return from a type of consumer good (residential housing) whose services are in large degree separable from the commodity itself and are bought and sold on markets". These aggregates are "essentially an appraisal of the final net product of the business and public economies of the country, two of the three important social institutions that contribute to the production of economic goods and exclude completely the product of the third — the family".[7]

1 Payments in kind by employers to employees and goods withdrawn by proprietors for consumption are to be included in national income and gross and net national product, provided they clearly represent income to the recipient. They are to be valued at cost to the employer or firm (in the case of food produced and consumed on farms, at farm prices). Income in kind to members of the armed forces, as already noted, will be included.

[7] *National Income and Its Composition, 1919–1938* (National Bureau of Economic Research, 1941), pp. 9 and 10. In these quotations Kuznets is referring to national income, but the statement is equally applicable to all our accounts.

2 The net imputed rent on owner-occupied dwellings is to be included in national income and gross and net national product.

3 Modified treatment will be given financial intermediaries such as banks and holding companies in order to include in national income and product the value of investment, account keeping, and other property management services rendered by these agencies without explicit charges. It is customary for firms in this field to short-cut usual business practices. They obtain payment for the services they render by retaining some or all of the income derived from lending the customer's funds, instead of paying such income to the customer and then making an explicit charge for their own services. This treatment, as developed for use by the United States Department of Commerce, is described in Dwight B. Yntema's paper. The present statement is a brief description of the techniques agreed upon at the meetings.

Interest income will be imputed to bank depositors. The amount to be imputed is equal to interest and dividend income received by banks minus interest actually paid on deposits. This imputed income item is offset in national product computation by an imputed expenditure by the individual, government, or business depositor for banking services. Only to the extent that interest is imputed to individuals and governments does this imputation increase national income and national product.

Property income of life insurance companies is measured in national income as if it were received directly by individuals. So far as total national income is concerned, it makes no difference whether the 'aggregates of individuals' method or the more refined technique to be adopted by the Department of Commerce (as described in Yntema's paper) is followed. In national product, claim payments by life insurance companies wash out as transfers between individuals, their operating expenses (excluding expenses incurred in managing real estate) appear as consumption expenditures, and the remainder of their receipts becomes individual savings.[8]

[8] In this treatment the total property income received by life insurance companies may be viewed as an imputed property income item to individuals, although to the extent that it includes savings it is really withheld cash income treated as if it were currently paid. In national product, operating expenses of life insurance companies are an imputed consumption expenditure.

The treatment of investment trusts, holding companies, and miscellaneous lenders is similar to that of life insurance companies, but too technically detailed to be discussed here. The reader is referred to Yntema's paper. The general procedure calls for the inclusion of operating expenses incurred in investment activities as imputed property income in national income and as a consumption expenditure in national product.

All items of imputed income in national income will be included also in income payments to individuals and private income before taxes. Government transfer payments not made in cash will not be included, however; to enter such items would lead to a breakdown of the distinction between the governmental and the private sphere of activity — particularly to obscuring the distinction between governmental expenditures, on the one hand, and consumption expenditures of individuals, which must be comparable to income payments to individuals, on the other.

### E *Treatment of Social Insurance and Similar Programs*

National income includes employer and employee contributions to social insurance funds but excludes benefit payments from the funds. Interest payments into the funds are in principle included as income accruing to individuals (though they may be eliminated as interest paid by the national government). Income payments to individuals exclude employer and employee contributions and interest received by social insurance funds as income accrued but not paid during the period, but include benefit payments from the funds as income paid although not accrued in the period. According to this formulation, the only reason for a difference between national income and income payments with respect to the treatment of social insurance funds is the difference in timing between the accrual of income and its receipt by the individual. Pension plans for government employees are covered by this treatment.

An identical solution for national income can be obtained by a different approach. Since social insurance payroll taxes are direct taxes, they are included in national income, and since interest paid into the fund is interest received by the government, it is included (unless eliminated as interest paid by the

federal government). Benefit payments, on the contrary, are excluded, for they are transfer payments. Unless payroll taxes are counted as direct business taxes, rather than personal taxes, however, this formulation would require the inclusion in income payments to individuals of both payroll taxes (since income payments are measured before the deduction of personal taxes) and benefit payments.

In the United States, where workmen's compensation is typically privately administered, claim payments, including the value of medical care, will be included in both national income and income payments. In Canada, workmen's compensation is handled via state funds, and the treatment will be the same as for social insurance funds. Medical care will be excluded from national income and income payments in Canada.

Self-administered private pension funds are treated in the same way as social insurance. In the case of informal plans where no fund is established, the employer contribution is taken to be identical with the benefit payment. If the plan is administered by a life insurance company the employer contribution is included in both national income and income payments, and the pension payment excluded, because life insurance companies are treated as associations of individuals.

### F *Other Items*

Government subsidies to private industry, so far as they can be identified, will be excluded from net and gross national product, but will not be deducted from national income. This treatment would seem to be required by the definitions adopted for the three aggregates; factor cost or income exceeds market price by the amount of the subsidy.

Business reserves for bad debts will be excluded from national income since they are not factor income, but, at least in the United States, will be included in gross and net national product since they enter into market prices.[9] Canada has not yet found it feasible to estimate this item and until it can estimate it, will of necessity exclude it from the product estimates.

Emergency and contingency reserves will be included in national income (in profits) and national product.

[9] Professional services, handled as a special case, are an exception in the United States. They are measured net of bad debts in the national product series.

Consumer debt interest is a troublesome item. An analogy with government interest can be drawn, since both represent interest on funds borrowed for purposes of consumption (if government and consumer purchases of durable goods are considered consumption rather than investment). This analogy has been used to justify the inclusion of government interest as payment for a 'consumer' service. If government interest is excluded, however, this parallel suggests the exclusion of consumer interest.

This argument may be countered in the following way. Since the bulk of consumer interest payments is consumed by the operating charges of the lender, it is a disguised payment for the lender's services in arranging the loan. In addition, the bulk of consumer debt arises from the purchase of consumer durables so that, to the extent consumer interest is 'pure' interest, it serves as a partial offset to the nonimputation of a return on consumer durable goods. Thus, the line of reasoning that leads the United Kingdom to include interest on the debt of local governments may justify the inclusion of personal debt. It has also been suggested that consumer interest paid on debt arising from the purchase of commodities should be counted as part of the price of the commodity.

No agreement was reached on the treatment of consumer interest, although it was much discussed. It is my understanding that the United States will include consumer interest, Canada will exclude it but impute an amount equal to the expenses of the lender in handling the loan (including bad debts), and the United Kingdom will probably follow the Canadian treatment. If consumer interest is excluded from national income, it is unique in that it represents a transfer payment from individuals to business.[10]

[10] If the economy is divided into private industry, government, individuals, and foreign countries (to the extent that they impinge on the other three sectors) then transfer payments can in principle arise between any one sector and each of the other three. Thus there are transfer payments from government to individuals (e.g., direct relief); from government to business (called subsidies); from government to foreign countries (e.g., lend-lease); from individuals to government (e.g., gifts); from individuals to foreign countries (personal remittances); from business to individuals (gifts to nonprofit organizations, treated as quasi-individuals; liability claims paid, chiefly for automobile accidents; prizes for contests); from foreign countries to individuals (personal remittances) and to government (e.g., reverse lend-lease). The other possible

Nonprofit organizations, such as chambers of commerce and trade associations, which furnish services to business enterprises, are treated like ordinary businesses.[11]

Nonprofit organizations, such as churches, hospitals, and labor unions, which furnish services to individuals, are treated as associations of individuals. Their services are valued at cost. Their investment income is not eliminated from national income. Payments received from government are treated as transfer payments.

National income refers to suppliers of production factors who are resident in or temporarily absent from the country. The pay of government employees is classified in the national income of the employing government, regardless of the location of the employee.[12] The armed forces abroad and employees of nonprofit organizations associated with them are specifically included. Income of domestic residents from investments abroad is included in national income; income of foreigners from domestic investments is excluded. Because it is difficult to estimate, no adjustment for corporate savings accruing to foreigners will be made. The other aggregates are consistently defined.

## G *Industrial Distribution of National Income*

Income originating in each industry measures the return to the labor and capital resources employed in it. In the United States it is computed as the sum of (1) compensation of employees,

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interflows do not seem to exist in any significant amount, unless consumer interest is treated as a transfer payment from individuals to business.

Not all transfer payments are treated alike in the national accounts. Those paid by business, for example, are excluded from national income but must be included not only in income payments, if they are paid to individuals, but also in the two product series, since they are covered by market prices; whereas those paid by government are excluded from the two product series.

There may also be 'transfer payments' within each sector (e.g., gifts between individuals and federal grants-in-aid to state governments) but these are netted out of the national accounts.

11 In principle, an item of business savings of these organizations must be included in national income, but statistically it can be ignored.

12 Except that foreigners employed abroad are to be included in the national income of the country in which they are located. This point was not discussed at the meetings but seems a reasonable modification. Otherwise, Germans employed by the American occupation forces in Germany, for example, would be included in the United States national income (as they are now, though somewhat inadvertently).

(2) net income of unincorporated enterprises, (3) income taxes and savings of corporations, and (4) the excess of the value of dividends and interest paid out over the value of dividends and interest received (including imputed interest received from banks).

Income originating in an industry also measures the 'value added' by it, defined as the excess of the value of the industry's product over (1) purchases of goods and services from other enterprises (including rents paid and imputed payments for banking services), (2) charges purporting to measure the consumption of durable capital goods, and (3) business taxes.

By this treatment, rented real property is classified as employed in the owning rather than in the lessee industry, and payment of rent is consequently considered a purchase from another enterprise. The correctness of this classification is clear in as much as contract rent is a gross receipt, not a net income share. Individuals owning property and receiving rents are treated, with respect to this activity, as individual proprietorships and classified in the real estate industry.[13] There was some dissent from this treatment of rent.

## 5 Changes in Department of Commerce Concepts

It may be useful to list the important changes in the Department of Commerce national income, gross national product, and income payments series that will result from the decisions just described. Most of these changes had already been decided upon before the meetings were held. Other changes, not discussed at the meetings or listed here, are also contemplated.

### *Changes affecting both National Income and Gross National Product*

Interest payments on government debt will be eliminated.

Imputed net rent on owner-occupied dwellings will be added.

[13] In Commerce Department estimates income of persons incidentally receiving rents, as contrasted to professional real estate operators, will be segregated from the net income of unincorporated enterprises proper in the real estate industry and labeled net rents.

One exception is contemplated in the United States and, I believe, in Canada. Farm rents paid to landlords living on farms will be included in the farming industry. This has the theoretical justification that renting of farm land (as lessor) is an integral part of farming operations, and also has certain practical advantages. It will be a departure from present Department of Commerce practice.

Government contributions to dependency allowances and to insurance funds for the armed forces, and income in kind to members of the armed forces will be added.

Compensation of foreigners employed abroad by the government will be eliminated.

The treatment of financial intermediaries will be changed.

*Changes affecting National Income but not Gross National Product*

Taxes on corporate profits will be added.

Depletion charges will be added.

Employer contributions to private pension plans will be substituted for benefit payments under such plans.

*Changes affecting Gross National Product but not National Income*

Subsidies paid to private enterprises will be eliminated.

*Changes affecting Income Payments to Individuals*

Imputed net rent on owner-occupied dwellings will be added.

Income in kind to members of the armed forces will be added.

Compensation of foreigners employed abroad by the government will be eliminated.

The treatment of financial intermediaries will be changed.

Business transfer payments will (or at least should, in principle) be added.

## 6 Remaining Areas of Difference

As a result of the Washington discussions, most of the quantitatively important differences among the three countries in measuring national income and national product will be eliminated. The treatment of interest on the national debt, taxes on corporate income, and imputed rent on owner-occupied dwellings will be uniform as a consequence of the adoption by the United States and Canada of the United Kingdom methodology.

Remaining differences in treatment associated with the problem of establishing a capital account for government con-

cern imputed interest and depreciation on government property and interest paid on the debt of local governments. Other differences concern the revaluation of inventories in national income and 'pure' interest on consumer loans.

# NATIONAL INCOME ORIGINATING IN FINANCIAL INTERMEDIARIES *

DWIGHT B. YNTEMA

AMONG THE LEAST SATISFACTORY CONCEPTS underlying national income methodology are those that have been constructed for dealing with financial intermediaries such as banks and life insurance carriers. Exception may well be taken to assumptions used in the theoretical approach for dealing with intermediaries as also to qualifications attaching to statistical procedures. Review and reformulation are overdue. The problem centers about suitable definition and measurement of property income flows into and from financial intermediaries. As will be seen, decisions concerning flows in this area have repercussions in nonintermediary industries.

The treatment the Department of Commerce and the National Bureau of Economic Research have accorded banks and life insurance carriers is itself a departure from procedures applied in ordinary industry areas, where property income items are taken net of property income receipts.[1] This standard pro-

* The proposed treatment of financial intermediaries is a joint product to which several members of the National Income Unit of the Department of Commerce contributed. In explaining the treatment, the writer does not imply any claim to originality but wishes to accept full responsibility for defects and faults of presentation. He takes this opportunity to express particular indebtedness to Edward F. Denison for his helpful criticism and encouragement.

[1] See, for example, *National Income in the United States, 1929–35*, (Washington, D. C., 1936), pp. 14–5, 54–5, 168–70, and 236–8; and Simon Kuznets, *National Income and Its Composition, 1919–1938* (National Bureau of Economic Research, 1941), II, 407–10.

cedure would require that interest receipts (as defined) be deducted from interest payments (again as defined) and that dividend receipts be deducted from dividend payments. Application of this procedure in certain financial and insurance areas, however, would lead to anomalous results in that net interest and dividends would typically tend to be negative. Negative or relatively small positive values for interest and dividends would depress total income originating, in more extreme cases making it negative as well. The effect may be observed in estimates for certain types of financial institution, notably holding companies, to which the standard procedure has been applied.

Results of this kind were not accepted as realistic measures of factor earnings for banks and life insurance companies and a special procedure was devised. On the assumption that financial intermediaries act as 'aggregates of individuals', interest (as defined) and dividends received by such businesses are treated as if they went directly to individuals. Then, income originating in financial intermediaries is calculated by summing compensation of employees, entrepreneurial income, if this is present, and corporate profits. There are no entries for interest paid or for interest and dividends received by intermediaries. This procedure yields more or less reasonable results for total income originating in intermediary industries.

The cure, however, introduces difficulties. All-industry totals for interest and dividends (and thereby corporate profits, since profits are the sum of net dividends and corporate savings) are unsound in that they do not provide measures of interest and dividends actually received by individuals. In addition, certain awkward statistical difficulties, particularly in the measurement of interest originating in nonintermediary industries, are resolved only by arbitrary assumptions. Interest going to individuals including 'aggregates of individuals' is measured as interest on long term debt of nonintermediary corporations, net of interest on government bonds received by such corporations, plus government bond interest and interest paid by individual mortgagors.[2] The compilation is at best little more than an in-

[2] The 'aggregates-of-individuals' assumption for financial intermediaries does not, of course, necessarily require this particular method of measurement. Still, it is because of the treatment of banks and life insurance companies as aggregates that it is at all acceptable to assume that long term interest received by business offsets short term interest received by individuals, implicit in this method of measurement.

direct estimate of the net interest flow to individuals, including that going via aggregates of individuals. Reconsideration on theoretical grounds as well as the development of a better methodology is definitely indicated. The object should be to devise a treatment that puts measurements for financial intermediaries basically on a par with measurements for other industry areas.[3]

It is proposed that financial intermediaries be recognized as businesses in which at least part of the interest and dividends received from the investment of funds made available by others is used in providing seemingly free services to those supplying funds to intermediaries. For transactions of this kind, which appear to short-cut usual business practices, imputation of income and services is sound and definitely in order. On the income side, a flow of property income over and above actual dividend and interest disbursements should be imputed in order to account for an implicit payment by financial intermediaries to those who supply them with funds. It is perhaps simplest to classify this imputed property income as imputed interest. On the product side, an imputation of services rendered by financial intermediaries is indicated, equal in value to the imputed income paid by intermediaries. In other words, it is assumed that the income imputed to depositors or investors is automatically used by them in purchasing imputed services from financial intermediaries. The imputed services are those rendered in connection with both the investment of funds and the servicing of accounts. Financial intermediaries are defined to include

[3] In 1932 Morris A. Copeland reviewed the 'banking-income dilemma' in the light of the then current work of W. I. King, comparing results obtained by a carefully considered reformulation he presented with those of Mr. King, 'Some Problems in the Theory of National Income', *Journal of Political Economy*, XL, 1 (Feb. 1932), pp. 1–51.

In brief, Mr. Copeland proposed the calculation of a 'value added in banking' equal to interest income of banks from equities in nonbanking business minus interest paid on deposits and profit on bank proprietorship equity invested in nonbanking businesses. For estimating profit on bank proprietorship equity invested in nonbanking businesses, Mr. Copeland suggested taking (1 minus national wealth in banking divided by proprietorship equity) multiplied by proprietorship income. The 'value added in banking' would in its entirety become property income receipts of nonfinancial enterprises. Mr. Copeland concluded that present information was inadequate for apportioning this charge among the several industry groups, and decided it was best to make the deduction from total property income without apportionment. In this general connection, see also his 'Concepts of National Income', *Studies in Income and Wealth*, Vol. One (National Bureau of Economic Research, 1937), pp. 23–6.

banks, life insurance carriers, and other financial enterprises, comprised chiefly of investment trusts and holding companies and credit agencies.

Funds are supplied to financial intermediaries by individuals and businesses and this requires a division of imputed amounts between the two. The income and services imputed to individuals on funds they supply to intermediaries become components of national income and of national product, respectively. In contrast, since income and services imputed to businesses cancel in all-industry summations, they do not appear in national income and national product. The income imputed on funds supplied by businesses must be treated as a property income receipt from the standpoint of business recipients of this income. Along with dividends and actual interest received, it must be included as one of the offsets to interest and dividend payments in obtaining net property income originating. Correspondingly, imputed services rendered businesses by financial intermediaries are intermediate, not final products. As will be seen below in the detailed discussion of each of the three intermediary industries, it is assumed that businesses receive imputed income only from banking. Apportionment procedures, consequently, are deferred to Section 4. Under the proposed division of imputed income between individuals and businesses, in summary, national income will include imputed interest income to the extent of part of the income imputed in banking and the entire income imputed in life insurance carriers and other finance.

In comparison with results that would be obtained were financial intermediaries treated like ordinary industries, the proposed calculation makes national income larger by the amount of imputed income going to individuals. The proposed treatment, as developed below, also shifts to financial intermediaries some of the property income that would originate in other industry areas. Finally, it accomplishes a transformation of total property income shares for all industries directed toward putting them into the form in which they are returned to individuals.

Comparison of the treatment developed here with the method commonly used is complex because of the peculiar nature of the latter method with respect to interest originating

in nonintermediary industries. The outline below should be helpful in this connection, in that it reviews underlying assumptions and the essential procedures of each.

## Comparison of Common and Proposed Treatments of Inter-Business Property Income Flows in National Income Calculations

| COMMON METHOD DERIVING FROM AGGREGATES-OF-INDIVIDUALS ASSUMPTION | PROPOSED METHOD |
|---|---|
| *Basic Assumptions concerning:* | |
| Financial Intermediaries | |
| Unlike other types of business, banks and life insurance carriers are assumed to act as aggregates of individuals with respect to receipts of property income. It is assumed that property income receipts of intermediaries on long term debt and corporate stock go to individuals via intermediaries acting as aggregates of individuals. Property income payments of intermediaries (excluding corporate profits) are not counted. | By taking account of a type of business transaction implicit in operations of financial intermediaries (banks, life insurance carriers, & other finance), these enterprises may be treated in the same manner as nonintermediary business. It is recognized that a property income payment (imputed interest) is made by financial intermediaries to those that supply intermediaries with investment funds. This imputed income is measured as interest and dividends (also net rents for life insurance) received by intermediaries less actual property income returned by intermediaries to those supplying investment funds. |
| Interest Flows of Nonintermediary Enterprises | |
| All long term interest as measured by interest on (a) government securities, (b) long term debt of corporations, net of interest received by corporations on government securities, (c) real estate mortgages outstanding against individuals is assumed to go to individuals, including aggregates of individuals, directly from the industry in which it originates.<br>The correlative assumption is that all other interest is short term and paid to businesses only. Short term interest is not counted, either where paid or where received. | Payments of both long and short term interest are taken in each case net of receipts of both types of interest, including imputed interest income received from banks. |

*Computation of Property Income Originating in:*

Financial Intermediaries

| | |
|---|---|
| For banking and life insurance carriers, only profits of corporations are counted. There are no entries for interest paid or for interest and dividends received. | For banking, life insurance carriers, & other finance (investment trusts, credit agencies, etc.), property income returns, including imputed income 'paid', are taken net of property income receipts. |

Nonintermediary Enterprises

| | |
|---|---|
| Interest is computed as mortgage interest paid by noncorporate borrowers, interest paid by government, and interest paid on long term debt of corporations net of government interest received by corporations. Dividends are taken net of dividends received by corporations. | Interest is computed as all interest paid net of all interest received by corporations including imputed income (interest) received from banks, and net of imputed income (interest) received from banks by noncorporate enterprises. Dividends are taken net of dividends received by corporations. |

## 1 Characteristics of Distributive Share and Industry Components of National Income

Perspective is needed for consideration of specialized problems relating to financial intermediaries. To this end it is desirable first to note important characteristics of distributive share and industry components of national income. Next, some attention must be given to the computation of property income originating in ordinary industry areas. This background is essential for consideration of the property income problem.

As a value measure of factor input, national income is the sum of the earnings of productive factors for their participation in current economic activity. This total is taken to comprise compensation of employees, net incomes of businesses both noncorporate and corporate, interest, and net rents and royalties accruing to individuals. Clearly, estimation of this total requires a complete yet unduplicated count of factor input values. Development of an unduplicated aggregate may then be taken as a first essential element in national income estimation.

Other basic characteristics relate to components of the unduplicated aggregate. First, consider the distributive share components of national income. The total, a measure of net returns to factors, comprises certain specified distributive shares. With respect to the share components, the viewpoint is basically one envisioning returns to individuals for input into a consolidated productive system. Because factor earnings from the system

are so viewed, the distributive share analysis of national income would be expected to show share earnings in the form that these leave the system. But this is also the form in which shares go to individuals, including quasi-individuals such as nonprofit institutions, and individuals acting collectively through government. As a second requirement in national income estimation, then, it is proposed that distributive share components of national income be measured in the form and amount going to individuals.

In contrast to the distributive share analysis of national income, the industrial components of national income show earnings from factor use in each industry. These provide measures that are fundamental to an appraisal of the relative importance of different industries, as judged by factor earnings. Since distributive share earnings in a particular industry may in the case of property income go either to individuals or to other industries, the net share figures for an industry cannot be measures of net returns going directly to individuals from the industry. They represent merely the industry's net contribution to all industry totals that in leaving the economic system must go to individuals. In brief, the third requirement in national income estimation is that factor input by industries be measured in the industries where factors are used, not in the industries where individuals make their contributions of factors.[4]

[4] Passing attention should be given to the alternative industrial allocation which would show factor earnings going directly to individuals from each industry. The two calculations can be contrasted by a simple illustration. Assume that two companies constitute an economic system and that factor earnings are in the form of profits and bond interest only, as shown below for companies A and B. Individuals, apparently, must own directly all the securities of Company B but not all of Company A since, judged by factor earnings, Company B holds one-fourth of the bonds and one-fifth of the stock of Company A.

| | COMPANY A | COMPANY B |
|---|---|---|
| Interest paid | 100 | 30 |
| Dividends paid | 50 | 75 |
| Corporate savings | 20 | 0 |
| Property income received | | |
| Interest | 0 | 25 |
| Dividends | 0 | 10 |

National income in this simple illustration is the sum of net interest and dividends paid and corporate savings.

| | | INCOME ORIGINATING IN | |
|---|---|---|---|
| | NATIONAL INCOME | COMPANY A | COMPANY B |
| Total | 240 | 170 | 70 |
| Interest | 105 | 100 | 5 |
| Dividends | 115 | 50 | 65 |
| Corporate savings | 20 | 20 | 0 |

## 2 Distributive Shares and Income Originating in Industries other than Finance and Insurance

In reviewing the treatment of property income flows in nonfinance industries, particular interest attaches to elements that assure that the income calculations have the basic characteristics noted above; namely, that national income be an unduplicated yet complete measure of factor input values, that the distributive share components of national income measure factor earnings in the form and amount going to individuals, and that industrial components indicate the value of net factor use in each industry. In practice, of course, such ends as these are realized only approximately since in statistical calculations minor atypical elements must be neglected. A case in point is that of firms in industries other than finance so far as these may engage in financial operations that account for only minor parts of total activity. When this happens, it is common practice to net out the income flows from minor activities without introducing the specialized procedures that would be used were financial operations dominant in company activities.

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Results of the alternative industrial allocation are somewhat different. We know that all the property income receipts of Company B came from Company A. Deduction of these receipts from total factor earnings in Company A leaves net earnings going to individuals from that company and there is no netting out of Company B returns. The income total for the two companies, however, is the same as before and the distributive share components of this total for the two companies combined are unchanged.

| | | Income returned to individuals | |
|---|---|---|---|
| | National income | Company A | Company B |
| Total | 240 | 135 | 105 |
| Interest | 105 | 75 | 30 |
| Dividends | 115 | 40 | 75 |
| Corporate savings | 20 | 20 | 0 |

It is clear that industry by industry the alternative calculation of national income components cannot measure net earnings from factor use. In the extremely simplified illustration, the economic system was assumed to comprise only two companies. This assumption greatly facilitated the alternative computation since it could be inferred that property income receipts of Company B must have come from Company A. If even a third company, Company C, had existed and had factor earnings like those of Company A and no property income receipts, the solution would have required additional data. To make the alternative computation in such a case, it would be necessary to know either the amounts of property income receipts of B from A and from C or the division of the factor earnings of the companies between amounts returned to other companies and amounts returned to individuals. Such data, however, are unavailable, so that the alternative calculation is not statistically possible. It is doubtful, furthermore, that results from the alternative calculation, if they could be obtained, would be as useful as those derived by the ordinary procedure.

The following comments touching in succession upon each distributive share are confined to procedural aspects of income calculations relating to inter-business flows of factor earnings in nonintermediary industries.

*Compensation of employees.* Wages and salaries and other compensation of employees are calculated on the assumption that labor input of hired workers is used in the industry that employs them. This rules out inter-industry flows of wages and salaries and their supplements. There can be no duplication on account of inter-business flows of wages. If services of laborers on the payroll of Firm A are made available to another firm or to consumers, it is assumed that Firm A is supplying business services. Payments to Firm A are for services rendered and are not in the form of compensation of employees.[5]

*Entrepreneurial income.* Net income of unincorporated businesses — sole proprietorships and partnerships — is estimated on the assumption that property income receipts in the form of interest and dividends of persons who are proprietors in addition to being individuals are in effect received by these persons as individuals, not as proprietors. If basic data on unincorporated businesses show interest and dividend receipts, these property income items are deducted from reported net income in estimating entrepreneurial income for national income purposes. Correspondingly, interest and dividends received are not deducted as receipt items from property income paid. This treatment forestalls possible duplications as between property and entrepreneurial income; also the industrial source of property income flows, that in basic data may be channeled through noncorporate firms, is properly that of originating industries.

It must be admitted that this assignment does not precisely measure the property share components of national income in

[5] It will be noted in the review of the corporate profit and interest shares immediately following that an analogous assumption is not made in the treatment of property income flows. If it were, it would call for treating interest and dividend income of business as receipts for services rendered (use or investment of funds). Only property income flows to individuals would then be in the form of interest and dividends (profits) and the computation of income would take the form suggested in the preceding footnote. But the assumption underlying such treatment is out of harmony with the manner in which business accounts are kept and, even if the treatment were desirable, statistical sources do not admit of the computation.

the form and amount actually going to individuals. Difficulties develop in the case of partnerships. Treating interest and dividend receipts of partnerships as if they go directly to individuals is clearly unrealistic since partners can consider such income as accruing to them only as partnership net income. Yet the assumption is necessary because of lack of much detailed data underlying entrepreneurial income and because it is simplest to combine the estimates for the two types of noncorporate business.

*Corporate profits.* Net income of incorporated businesses is taken net of receipts of corporate dividends. As the netting out of dividends received is entirely against dividends paid, corporate savings are unaffected by the adjustment. The fact that corporate profits in national income accounts are measured exclusive of capital gains and losses substantially prevents the corporate savings (positive or negative) of one company from being reflected in the profits of another. This treatment satisfactorily meets criteria relating to duplication in the total, distribution share composition, and industrial source.

Because, in the past, reports on dividend receipts covered only dividends received from domestic corporations, the practice has been to net out only dividends received from domestic corporations. This left dividends from abroad implicit in the profits of industries receiving such dividends. In consequence, it was necessary that the dividend component of the balance of payments entry in the miscellaneous industry be computed as dividends from abroad received by individuals minus all dividend payments abroad. Since information on total dividends receipts by corporations is now available as far back as 1937 it is possible to eliminate this incongruity. Netting out total dividend receipts against dividends paid gives a better measure of net factor earnings by industries. The meaningfulness of the adjustment for international flows of property income is improved by taking all dividends received from abroad minus all dividends paid abroad.

*Interest.* The interest component of national income has in the past been estimated as the sum of interest payments on long term debt outstanding against nonintermediary corporations, governmental bodies, and real property owned by individuals.

Corporate receipts of government interest payments have been netted out against long term interest payments of corporations. Short term interest then is an inter-business flow. The assumption introduces arbitrary elements not only in the national income total but in its industrial and distributive share components as well.

The procedure proposed makes it possible to recognize both long and short term interest flows. Interest for an industry is computed as total interest paid by all enterprises minus total interest (explicit and imputed) received by corporations and minus imputed interest received by noncorporate enterprises. The imputed interest that is allocated to the industry from banking is discussed below. The resulting estimate is theoretically sound in that it is a direct measure of net earnings for factor use in each industry.

Incidental attention must be given at this point to the need for proper coverage of interest payments made by individuals under the proposed procedure. As was done in connection with the earlier method, all long term interest paid on mortgages outstanding against real estate owned by individuals must be counted; this appears as a component of the interest originating in real estate. Second, interest payments by individuals on indebtedness other than mortgages must be included, at least to the extent that it is paid to business. From the standpoint of estimation, it may be necessary to omit inter-individual payments of nonmortgage interest, placing this outside the scope of economic activity encompassed in national income estimates. Nonmortgage interest payments of individuals to businesses are entered in some suitable industry group, presumably the 'private households' industry of the service division along with wages of domestic service workers.

*Net rents.* Like entrepreneurial income and corporate profits, this return is computed net of costs. It is basically a special type of entrepreneurial net income realized by individuals from real estate they own and either rent or use for housing as owner-occupants. In the latter case, the return is an imputed net rent; the Department of Commerce is increasing its national income coverage to include this item. Returns netted by businesses from the lease of their real estate holdings do not, of course, appear

as net rent in national income complications; they are implicit in business profits. Realizations from real estate used by owning businesses are similarly in business net income. The remaining area of real estate ownership, government, can be divided between properties leased to tenants and other properties. Net rents realized on the former will be taken into account in calculations for government. Imputed realizations on other government properties are not covered in Department of Commerce estimates, essentially because of difficulties in making trustworthy estimates.

Net rents realized by individuals on their real estate holdings are grouped together and classified under real estate in the broad finance, insurance, and real estate group. It may be noted first that in national income tabulations this return is 'net' in the sense of being net of various expenses and charges. This is quite different from the meaning of net as used in connection with interest and dividend payments. Also, the classification of net rents as a type of income originating in real estate is quite independent of any industry implications concerning property use. On theoretical grounds, such as the smallness of residual net rents in comparison with gross rents and because of numerous statistical difficulties besetting a calculation of net rent by property-using industry, it is best to view gross rents paid by tenants simply as payments for property-use services. Net rents then become a specialized business profit.

## 3 Finance and Insurance Industries

In turning from general procedures applicable in most industry areas to the development of modified methods suited to segments of the finance and insurance industries, it is worth while first to note explicitly the distinguishing characteristics of the groups that are to have special treatment. The financial intermediaries comprised in the special groups differ from firms in other areas in that a major if not substantially complete share of total receipts is in the form of interest and dividend income. This is not to imply that businesses in other industrial areas do not typically have some property income; it is intended only to point out that the dividing line involves little more than a difference in degree. In practice, however, this dividing line is im-

portant since whenever interest and dividend income is sizable in comparison with income from sales of commodities or services, ordinary statistical methods used in calculating property income originating in an industry give thoroughly untenable measures of returns for factor use.

The fact that imputation is undertaken in connection with financial intermediaries when these differ from other industries only in degree suggests that some adjustment of procedures might be desirable also in other industrial areas. On a theoretical level, this would necessarily follow. Quantitatively, however, the adjustment would not be very important; moreover, it would be necessary to rely upon rather doubtful solutions to difficulties confronting statistical measurement.

The procedure proposed is simple in basic outline. It requires the imputation of an interest payment, equal to the value of services rendered without explicit charge, to supplement actual disbursements of interest plus certain dividends. However, at least a minimum amount of detail concerning procedure and methodology must be added before the outline takes on much meaning. Chief problems center about the definition of the interest to impute and its allocation between businesses and individuals and among businesses. This detail will tend to differ among the several types of financial intermediary. Consequently, different types of intermediary — banks, other finance (mainly long and short term credit companies, investment trusts and holding companies), and life insurance carriers — are discussed. Each area is sufficiently homogeneous to admit of reasonable similarity in the treatment of property income flows.

## 4 Banking

If usual procedures for dealing with inter-enterprise property income are applied in banking, the large interest and dividend receipts of banks result in negative net property returns. The sum of net property income and compensation of employees is also negative and clearly does not measure the cost of factor use in banking. The difficulty is overcome and at the same time the calculation for banks can be put on a sound basis consistent with the treatment accorded other industries by recognizing a type of business transaction that is implicit in bank operations

— the supplying of seemingly 'free' services to depositors in return for 'free' use by banks of depositors' funds. The amount of imputed property income originating in banking is taken as interest and dividend receipts minus interest payments. It is allocated to depositors including individuals, government, and industries. From the standpoint of receiving industries, the imputed income allocated to business is essentially similar to other property income received. Along with interest and dividend receipts, it must be deducted from property income payments in arriving at net income originating.

The nature of the property income computations can best be shown by numerical illustration. Part A provides illustrative receipt, expenditure, and profit figures for all other industries combined and for commercial banking. Part B shows the computation of income originating in each industry group and national income. For convenience, receipts and expenditures relating to intermediate products are consolidated for enterprises within each group, but not interest and dividends. Further, entries for imputed income and imputed services are included. The numerical magnitudes are arbitrary.

### Part A

Receipts, Expenditures, and Profits for Banking and for Other Industries

| | Other Industries | | Banking | |
|---|---|---|---|---|
| *Receipts* | | | | |
| Sales of final products | 170 | | 55 (50 imputed) | |
| Sales of intermediate products | 30 | | 40 (all imputed) | |
| Total sales | | 200 | | 95 |
| Interest received | 10 | | 70 | |
| Dividends received | 5 | | 30 | |
| Receipts of interest imputed on deposits | 40 | | | |
| Total other income | | 55 | | 100 |
| Total receipts | | 255 | | 195 |
| *Expenditures and Profits* | | | | |
| Expenses to other industries | 40 (imputed) | | 30 | |
| Wages | 95 | | 60 | |
| Interest paid | 75 | | 10 (on deposits) | |
| Dividends paid | 35 | | 3 | |
| Undivided profits | 10 | | 2 | |
| Payment of interest imputed on deposits | | | 90 | |
| Total | | 255 | | 195 |

PART B

Income Originating in Banking and in Other Industries and National Income

| | INCOME ORIGINATING Other Industries | Banking | GROSS TOTALS | NATIONAL INCOME |
|---|---|---|---|---|
| Total | 160 | 65 | | 225 |
| Wages | 95 | 60 | 155 | 155 |
| Interest | 75 | 10 | 85 | 5 |
| Dividends | 35 | 3 | 38 | 3 |
| Undivided profits | 10 | 2 | 12 | 12 |
| Payment of interest imputed on deposits | | 90 | 90 | 50 |
| Deductions for property income received | | | | |
| Interest | −10 | −70 | −80 | |
| Dividends | − 5 | −30 | −35 | |
| Receipt of interest imputed on deposits | −40 | | −40 | |

In the illustration it will be seen (Part A) that banks receive 100 in interest and dividends and 5 in service charges to individuals (sales of final products). Of the 100 interest and dividend receipts, 10 is paid out as interest on time deposits, leaving 90 retained by banks. This 90, together with the 5 received from charges to individuals, is used by banks for expenses to other industries, wages, and profits. In retaining the 90, banks may be said to short-cut ordinary business procedures which would call for (1) payment of 90 to depositors, this being the major share of the interest and other income received by banks from the investment of deposit funds, and (2) a counterbalancing service charge of 90 to depositors for services rendered in carrying depositors' accounts and investing their funds. Recognition of these two balancing transactions results in entries of 90 for receipts from sales of final and intermediate products by banking and payment of 90 income imputed on deposits. Since 40 of the imputed income goes to other industries (intermediate products), the 'other industry' column carries entries of 40 in receipts of income imputed on deposits and 40 in expenses to other industries, i.e., banking.

Compilations of national income and its components (Part B) are derived directly from entries in Part A, including imputed items. Deductions for property income received by other industries include the receipt of 40 in income imputed on deposits. Banking has an imputed income payment of 90. Algebraic addition yields 160 for income originating in other industries and 65 in banking. National income totals 225, equal to total sales of final products (170 plus 55). The distributive share com-

ponents of national income are obtained by adding entries for the two industries and netting out the property income deductions. For the sake of clarity, interest imputed on deposits was not consolidated with other interest in showing distributive share components of national income.[6]

The income computations in Part B of the illustration meet the tests suggested in Section 1. First, the total is an unduplicated yet complete value measure of net factor input. Second, the distributive share components of the total are in the form and amount actually going to individuals — one share is necessarily interest imputed on deposits. Finally, income originating in each industry measures factor earnings for net input; in banking, for example, this is simply the sum of wages and profits.

Other procedures would give somewhat different results. If banking is treated like an ordinary industry, the imputed entries are dropped. Then income originating is −25 for banking and 200 for other industries, and national income, 175.

If banking is to be treated as an aggregate of individuals, property income flows to banking that are creditable to individuals would be treated as if they go directly to individuals. On the assumption that all interest and dividend receipts of banking accrue to individuals, imputed entries would be dropped as well as interest paid by banks. Then income origi-

[6] The illustration raises usual problems in connection with the netting out of positive and negative entries for interest and for dividends in national income tables. Total property income originating in an industry (interest plus dividends plus corporate profits) is properly measured in net form. All-industry totals for each share must also be in net form in order to show amounts returned to individuals. Within an industry, deductions of interest received from interest paid or of dividends received from dividends paid gives a specialized figure that must be carefully interpreted. It shows the return for the net use of the particular factor in an industry or the industry's contribution to the all-industry total for the factor.

The difficulty with such figures arises from the fact that dividend receipts may be transformed into interest payments, or vice versa, and, in extreme cases, the figures for either item may be negative. In the illustration above, for example, net dividends originating in banking are −27 (not especially descriptive of actual banking data), indicating a net transformation of dividends received into interest returned (paid and imputed). The combined figure for net interest and dividends (or profits), however, is meaningful as a measure of net property income originating in the industry. In contrast, gross interest and dividends paid by an industry are realistically descriptive of actual business disbursements, as based upon tax returns to the Bureau of Internal Revenue, and have analytical value in this connection. Consequently, it may be expected that gross dividends and interest paid as well as net figures will be made available to users of national income data.

nating in banking (65) would be calculated as wages (60) plus profits (5). For other industries the total originating would be 200, comprised of wages (95), net interest (65), and profits net of dividends received (40). National income would be 265.

The calculation commonly made under the aggregates-of-individuals assumption gives still different results. It is based upon a distinction between long and short term interest paid by nonintermediary enterprises; interest on long term debt is assumed to go to individuals. In keeping with this assumption, let it be agreed in connection with the example that long term interest accounts for 60 of the 75 interest total paid by other industries. Assume also that interest received by other industries is from government bonds. For the customary computation under the aggregates-of-individuals assumption imputed entries are dropped, as are interest paid on bank deposits and banking receipts of interest and dividends. Then, income originating in banking is 65, comprised of wages (60) and profits (5). Income originating in other industries totals 185, the sum of wages (95), interest (figured as 60 minus 10, or 50), and profits net of dividends received (40). The 250 national income total includes 155 in wages, 45 in profits, and 50 in interest.

It seems evident that the ordinary industry treatment of banking gives an anomalous negative income originating in banking that is thoroughly unacceptable in measuring factor earnings in banking in terms of factors in use in the industry. Also, the relatively low totals for national income and for interest and dividends reflect an unsound canceling of part of this kind of property income. The aggregates treatment based upon the assumption that all property income receipts of banks accrue to individuals gives satisfactory results for banking. It overstates national income, however, through failure to recognize that some of the property income must accrue to business. Furthermore, the property income components of national income simply are not in the form going to individuals, save by assumption.

The treatment of banking currently in vogue as applied to this illustration, including the assumptions concerning long term interest, gives a national income total that reflects the fact that short term interest (15) is only fortuitously related to income imputed on business deposits (40). Also important in con-

nection with this method is the deficiency apparent in the share components of national income since interest and dividends going to banks (banks in effect are assumed to act as aggregates of individuals) are included as such in the interest and dividend components of national income as if these actually went to individuals. Of course, by this method neither interest paid on deposits nor income imputed on deposits is counted in the share compilations.

In a brief statement of the general rationale underlying the proposed treatment of property income flows of banking, note should first be taken of the two basic types of banking activity with which we are concerned: provision of demand (checking) and savings account services, and activities related to the investment of funds. In the first connection, banks provide facilities for accepting deposits and for servicing accounts. In the second, banks may be viewed as depositors' agents, investing deposit funds in order to obtain interest (plus a small amount of dividend) income. Some of this income is passed on to depositors, mainly in the form of interest on savings deposits, but the major portion is retained by banks in order to finance their investment and deposit services. The treatment proposed assumes that all interest and dividend income of banks (but not net rent realizations) accrue to the account of depositors, either in the form of interest on deposits or in the form of income imputed on deposits. This implies that bank profits come from banking operations proper, as distinct from the investment of funds yielding interest and dividend income from other industries.

In using the foregoing formulation, it will be recognized, first, that the distributive shares comprised in the national income total for all industries will include only the income imputed on deposits of individuals. The income imputed on private business deposits will cancel in the all-industry summation. Second, final products will include imputed investment and account services rendered by banks to individuals. Again, imputed services provided by banks in connection with deposits of private business are intermediate products. Finally, all interest and dividend income of banks must be counted in calculating the property income received by banks. The total must include the short term interest which is purposely omitted when banks are treated as

aggregates of individuals. Short term interest received by banks comes from noncorporate as well as corporate businesses and also from individuals as such. Interest paid by businesses appears in the income originating tabulations of the many industry groups that borrow from banks. Interest paid by individuals to banks also must appear as part of interest paid in some proper industry, such as the 'private households' component of service.

Since the preceding discussion deals specifically with commercial banking, a word should be added concerning the treatment of mutual savings banks. As depositors and stockholders are identical it is necessary to define imputed income as total interest and dividend receipts minus interest and dividends paid depositors and minus interest paid on capital notes and debentures. The imputed interest, consequently, includes one component that is paralleled on the product side by an imputed service flow and a second component that represents a conversion of retained net earnings of mutual banks to imputed interest. The imputed interest paralleled by services is defined as interest and dividend receipts minus net income before income and excess profits taxes. Net income is, of course, divided among taxes on net income (insignificant), 'interest and dividends' paid, and a remainder representing net undistributed earnings. The component series for imputed interest representing retained net earnings is defined as the remainder of net income after 'interest and dividends' paid but including taxes on net income. By this treatment, income originating in mutual savings banks is equal to compensation of employees, since cash interest and dividends paid and imputed interest are exactly offset by interest and dividend income, and retained net earnings are eliminated.

A brief note should be added concerning the allocation of imputed income originating in banking among individuals, government, and business, and within business among the many industries. Following the basic approach used in measuring imputed income in banking, it is assumed that the apportionment is determined by the distribution of deposits. Obviously, the statistical allocation of imputed income among depositors must involve various assumptions and approximations. It is believed that these do not significantly violate facts. First, mutual savings banks are isolated by assuming that individuals alone

supply them with funds. Income imputed in mutual savings banks, then, is allocated entirely to individuals.

Regularly reported data for commercial banks provide a distribution of demand and time deposits between government — federal and state and local — and individuals, partnerships, and corporations. It is assumed that this deposit information based on bank records effectively shows the composition of funds supplied to banks by the two classes of depositors. Allocation of imputed income between the two follows this distribution. In using this deposit pattern as the basis for allocation, the following procedure may be adopted: (1) combine imputed income and interest paid on demand and time deposits; (2) allocate this total according to the distribution of demand and time deposits of the different types of depositor; and (3) from components obtained under (2), deduct interest paid on demand and on time deposits, each distributed according to deposits ownership.

For the further apportionment of income imputed to individuals, partnerships, and corporations, it is necessary to turn to special studies in the field.[7] Without going into details, these studies may be said to supply essential information by which it is possible to allocate the ownership of deposits between individuals and businesses, and within businesses among major corporate and noncorporate types. This information provides the basis for making the primary allocation of imputed income going to individuals, partnerships, and corporations. Again, the total of imputed income and interest paid on deposits for the group would first be allocated among the several depositor types with subsequent deductions of interest paid and service charges, each properly distributed against depositor types. For the finer industrial distributions within major industry divisions, it is necessary to turn to balance sheet and other data, such as are reported by the Bureau of Internal Revenue. Through the use of cash data for industries it is possible to distribute approximately imputed income among corporate industry components

[7] Solomon Shapiro, 'The Distribution of Deposits and Currency in the United States, 1929–1939', *Journal of the American Statistical Association*, Vol. 38, No. 224 (Dec. 1943), pp. 438–44.

Articles on the ownership of deposits in the *Federal Reserve Bulletin*, Aug. 1943, Oct. 1943, May 1944, Nov. 1944, and June 1945.

of the major divisions. It is probably necessary also to carry through an allocation of imputed income to noncorporate business despite difficulties in distinguishing satisfactorily between deposit funds a business man may use for business and for purely personal purposes. Failure to carry out this step would tend to inflate national income by an amount that rightly should be charged to business. This treatment of imputed property income received by noncorporate business differs, of course, from procedures adopted for non-imputed interest and dividends received.

## 5 Finance, Not Elsewhere Classified

For national income study, the finance industry proper may be divided into (1) banking, (2) security, commodity-exchange, and over-the-counter brokers and dealers, and (3) other finance. The third comprises enterprises such as investment and holding companies of various kinds, long and short term credit agencies, and other miscellaneous financial businesses of relatively minor importance. Investment and holding companies dominate other finance as illustrated by the fact that their interest and dividend receipts accounted in recent years for well over three-quarters of the group's receipts of interest and dividends; most of the remainder is for the credit firms. Nearly 90 percent of total receipts of investment and holding companies is in the form of interest and dividends as against about one-third for the other categories combined. It is this rather heterogeneous financial division that must now be considered with respect to the measurement of property income flows.

Estimation of property income for finance, n.e.c., raises problems essentially similar to those met in banking and, as might be expected, a treatment may be formulated to parallel the computation for banking. Interest and dividend receipts of credit and investment firms may be assumed to reappear as interest paid and profits realized from investment operations plus an element of income imputed on invested funds. Imputed income is calculated as interest and dividend receipts minus interest paid and profits. This imputation presumes a comparable imputation on the product side of the account as if the imputed income, which, by assumption, is paid out, is forthwith used by recipients in purchasing investment and related services from

companies making the imputed payments. The treatment is a distinct departure from procedures commonly applied. In the past, the financial activities of the kind under consideration were part of the miscellaneous industry in which the aggregates-of-individuals assumption was not used.

The procedure for dealing with the other finance group may be illustrated by the use of six assumed items. Income imputed

| | | |
|---|---|---|
| 1 | Interest received | 50 |
| 2 | Dividends received | 80 |
| 3 | Total property income | 130 |
| 4 | Interest paid | 20 |
| 5 | Net profits, before income & excess profits taxes of 10 & without deduction for dividends received | 85 |
| 6 | Total interest paid & profits | 105 |

on investment company funds is calculated as line 3 minus line 6, or 25. This is also the value of imputed services. If, in addition, compensation of employees is taken to be 15 (the remaining 10 is used for expenses to other industries), income originating equals 15.

| | |
|---|---|
| Income originating | 15 |
| Compensation of employees | 15 |
| Interest paid | 20 |
| Net profits before taxes | 85 |
| Income imputed on investment funds | 25 |
| Deductions for property income received | |
| Interest received | –50 |
| Dividends received | –80 |

Total income originating is inevitably equal to compensation of employees since property income receipts offset interest paid, net profits, and imputed income. The computation provides a mechanism whereby property income receipts in the form received by financial intermediaries of the other finance group are converted into property income as this accrues to individuals, including the element of imputed income. This is important to the all-industry summation by shares in that the several property income entries — positive and negative — contribute toward putting the net share totals for all industries in the form received by individuals. Furthermore, total income originating is consonant with earnings of factors used in the industry group.

Application of the foregoing formulation is best restricted to the corporate form of organization and to certain mutual companies, such as savings and loan associations, which need not be discussed. In most of the lines of financial activity coming within the other finance group (except security, etc. dealers and

brokers), nearly all the business is done by corporations. Only in the small miscellaneous segment of other finance are partnerships and sole proprietorships of even minor importance, accounting for perhaps 10 percent of total receipts and a considerably smaller percentage of interest and dividend receipts. Consequently, it may be assumed for statistical computations that dividend and interest receipts of noncorporate firms in the other finance group accrue as such to individuals. There are no entries for noncorporate business receipts of interest and dividends and, if included in reported figures, the effect of such property income receipts is removed in measuring entrepreneurial income. The imputed income in the case of corporations may be viewed as comprising both imputed dividends and imputed interest. It is probably best, however, to call it all imputed interest; this will keep all the imputed income in the interest category.

Proper allocation of income imputed in other finance is difficult because of lack of information concerning the distribution of ownership among individuals and the numerous industry groups. Amounts going to industry should be treated as property income received (deductions from property earnings wherever received) and only amounts allocated to individuals would enter all-industry totals. But, as very little information regarding ownership is available, it is perhaps best to assume that all imputed income of the other finance group goes to individuals. Overstatement from this assumption would be minor.

Because of its influence on the resulting imputations, it is desirable to review generally the statistical procedures that may be used in estimating imputed income. Were income accounts of other finance enterprises in such form as to isolate accounts for loan and investment activities from accounts for other operations, the several types of corporation included in this division of finance could be treated directly in the indicated manner. But profits, as reported, are for all operations of each company; i.e., returns on loans and investments are combined with realizations from other activities. If the latter are appreciable, the treatment suggested above becomes untenable. This is illustrated by the rather extreme case in which interest and dividends received are smaller than interest paid plus profits, resulting in a negative imputed income figure. It becomes necessary,

consequently, to effect some statistical isolation of loan and investment activities so that the special treatment is applied to property income flows alone.

Perhaps the most promising approach is to use information for a specific type of financial company in which operations are substantially confined to loan or investment activities. If data are available, it is possible to calculate a relation between imputed income (interest and dividends received minus interest paid and profits) and interest and dividend receipts that can be applied to interest and dividend receipts of the 'other finance' group generally. This, of course, assumes that loan and investment activities proper of all companies are similar to the operations of the particular subgroup, at least with respect to property income calculation.

Investment trust companies of the management type probably offer the most acceptable approximation to the requirements noted above. Not only is the necessary minimum of data available, so that it is possible to carry out the computations, but operations of these companies also are substantially confined to investment activities. Further, these companies form a subgroup of the broad investment trust and holding company group that accounts for a major share of the property income received in other finance.

### 6 Security and Commodity Exchange Brokers and Dealers

This group may be treated like ordinary industries as far as property income receipts are concerned, since enterprises in it do not act in appreciable degree as financial intermediaries with respect to property income flows.

It may be noted in passing that current revisions of data by the Department of Commerce will treat brokers and dealers like ordinary industries in respect of capital gains and losses. The change will remove from profits of this industry, as computed in the past, elements that are due to brokers' gains or losses in trading on their own account. Profits of this kind have so far been included in national income on the grounds that 'trading on own account' was an integral part of the brokerage business, the trading profits being considered part of factor income from 'productive' services.

## 7 Insurance Carriers

In dealing with property income flows of insurance carriers, it is desirable from the outset to distinguish life insurance companies from carriers of other types of insurance. The former are required to set aside and accumulate substantial legal reserves against the fulfilment of their contracts which normally span several years and typically call for payment of sizable sums. In contrast, other types of insurance carrier (fire, casualty, marine, etc.) ordinarily issue term insurance against possible loss during a relatively short period, such as a year or a very few years. Accumulation of reserves is not an inherent feature of nonlife insurance. This distinction underlies the different treatment of the two groups of insurance carriers as developed below.

*Life insurance carriers.* A much simplified statement of the operations of life insurance carriers would show that income is derived from two main sources: premiums paid by policyholders and property income in the form of interest, dividends, and rents. This neglects, purposely, the relatively small premium income from nonlife policies. Largest expenditures are for death losses, matured endowments, annuities, dividends, and surrendered policies. Other expenditures account for about one-third of the total. The excess of premium and property income over payments to policyholders and other expenditures goes very largely into increased reserves, becoming in effect savings of individuals. The fact that most life insurance carriers are mutuals provides support for viewing increases in reserves as savings of policyholder individuals rather than savings of corporations.

It is proposed to treat life insurance carriers so that property income receipts from the investment of funds appear as income imputed to policyholders. All property income is assumed to accrue to policyholders and the amount of imputed income is equal to property income receipts. In the measurement of property income, interest and dividends may be taken in gross form as received but rents received must be put on a net basis. The treatment accorded interest and dividends is analogous to that suggested for other financial intermediaries. Net rents, however, are a special case. Net rent realizations of life insurance carriers originating in the industry are converted into income imputed

to policyholders. This is essentially similar to the manner in which realizations upon rental of real estate owned by a manufacturing corporation, for example, automatically appear in the profits of the corporation. In life insurance, the net rent takes the form of imputed income.

By the proposed procedure, the distributive share components of income originating in life insurance carriers include an item of imputed income 'paid' that is equal to receipts of interest and dividends plus net rents realized. Total income originating in the industry is numerically equal to compensation of employees, profits of nonmutual corporations,[8] and net rent — imputed income paid being exactly offset by interest and dividends received (which are deducted as property income receipts) and net rents (which originate in the life insurance industry). The compilation for income originating may be summarized by illustrative numerical magnitudes.

| | |
|---|---|
| Income originating | 190 |
| Compensation of employees | 150 |
| Corporate profits (measured as dividends paid) | 20 |
| Income imputed to policyholders * | 1,050 |
| Deductions for property income received | |
| Interest | –1,000 |
| Dividends | –30 |

* Includes 20 arising from net rent realizations resulting, for example, from contract rental receipts of 60 minus property management costs of 40.

It has been common practice to assume that dividends and long term interest received by life insurance carriers go, as such, to individuals via insurance companies as aggregates of individuals. This treatment gives a total income originating in life insurance carriers that is lower than the total resulting from the proposed procedure by the amount of imputed income attributable to net rent. Presumably, this increment is found also in the national income total since by the prior method net rents included only those going to individuals (total rents minus rents going to corporations, and life insurance carriers included with ordinary corporate businesses). In addition, the all-industry aggregates for property income shares showing amounts leaving the economic system are modified by the removal of dividend

[8] As implied in the discussion of savings, the nature of available data makes it necessary to define corporate profits of nonmutual corporations in the life insurance carrier division as dividends paid to stockholders. To the extent that there are savings accruing to stockholders of nonmutual companies, national income is understated; the matter is relatively unimportant, however, since most life insurance carriers are mutuals.

and interest receipts of life insurance carriers and the substitution of an imputed income item, and by a more complete accounting for the short term interest flow. In both procedures it is assumed that policyholders are individuals, so that all imputed income accrues to individuals, none to business. This last assumption conflicts with reality in a minor way, i.e., to the extent that businesses may choose to protect themselves by taking out life insurance on individuals.

The proposed treatment requires the inclusion in consumption expenditures of an allowance for company expenses in connection with financial operations through which interest, dividends, and net rents are realized. Expenses in connection with net rents will be only the minor expenses in addition to the usual costs of real estate rental operations that are charged against gross rentals in obtaining net rents. Consumer expenditures on life insurance then are defined as total operating expenses (excluding payments to policyholders) minus (1) expenses allocated to accident and health insurance and (2) costs of real estate operations as such. An additional point deserves mention, namely, that interest paid by individuals on borrowings from life insurance carriers must appear as interest paid in some proper industry such as the private households group within service.

*Carriers of insurance other than life.* Dealing in fire, marine, automobile, casualty, and related types of risk, the carriers of insurance other than life are predominantly stock companies that offer term insurance against specified risks in return for stated premium payments. Balance sheets of these companies as a group show that capital and net surplus account for nearly half of the liability total. Unearned premiums, unpaid losses, and other liabilities are in diminishing order of importance, constituting, respectively, about one-fourth, one-sixth, and one-tenth of total liabilities. On the asset side, we find that roughly three-fourths of the total is invested in bonds, stocks, and mortgages, and a minor amount in real estate. The remaining portion is made up very largely of cash, uncollected premiums, and agents' balances. Interest and dividend income is about $150 million a year.

On the basis of the foregoing, it might be argued that policyholders typically maintain substantial balances in nonlife in-

surance carriers (unearned premiums less unpaid premiums) and that these are in effect invested by the carriers in income-producing assets. Income from the investment of prepaid insurance might be imputed to policyholders in the belief that premiums are lower by the amount of earnings on prepaid insurance funds. An amount well under $50 million might be imputed on this basis. In comparison with the ordinary industry treatment commonly applied to the group,[9] the effect would be to increase income originating in the industry. This would be accomplished very largely by shifting relatively minor amounts of property income from other industries to nonlife insurance carriers. Since most of the imputed income would accrue to business (including home owners) rather than to individuals, the national income total would be affected little.

Despite possible merits of the refinement, it seems preferable to use the ordinary property income procedure in the case of insurance carriers other than life. It is much simpler and the amounts involved are relatively small. Netting out of property income received from factor earnings does, of course, give rise to negative net interest figures for the industry and also negative property income (profits plus interest paid minus interest and dividends received). But the amounts involved are relatively small and, as noted above, national income is substantially the same by both procedures.

## *COMMENT*

### Solomon Fabricant

All who have tried to make international comparisons of economic or social statistics have learned to fear differences in concept and terminology. They would wish to sing hymns of praise to the three government agencies whose agreement on so many points is embodied in Mr. Denison's paper. Although I would join in that chorus, I shall not now take the time for congratulations. The very importance of such an agreement makes it imperative that it be reviewed carefully by this Conference,

[9] The treatment applied until now by the Department of Commerce made a special case of nonlife mutual companies. Dividends received by mutual companies in insurance carriers other than life went to individuals on an aggregates assumption. Consequently, there was no deduction for them (as estimated).

preferably before it is acted upon. I shall use what time I have to start the ball rolling by outlining some of my own reactions to the report.

## I

The report is, I think, one of the most important that has been presented to the Conference in its ten years of existence. It is also, I am afraid, one of the more tantalizing and less satisfying of those we have had the duty and pleasure of reading.[1]

Owing to the brevity of the report (whose deficiencies Mr. Denison himself quite frankly emphasizes), it is impossible to come to close grips with the Department of Commerce or the other national agencies on the issues raised. If no explanation, or no adequate explanation, is given of the basis on which the decisions were made and agreement reached or not reached, what can one really do by way of criticism? It seems futile merely to repeat the discussion already published in five volumes of Conference papers and a host of other reports, with which all members of the Conference are familiar. Progress cannot be made along that line.

Yet we shall have to live with the decisions of the three agencies participating in the agreement, and therefore something must be done to keep the issues open. What I say below is said not because I believe for a moment that the three governmental agencies are unfamiliar with the points of view outlined, but because I assume that the more specific my comments, the more effectively will my purpose be attained. That purpose is, simply, to suggest that differences of opinion persist; that it may be argued that much has not been settled by the agreement and that some of the steps it proposes even appear to be backward; and, therefore, that a fuller statement by the three official agencies, individually and collectively, as a basis for much more detailed discussion, is urgently needed.

Since there is not much point in discussing concepts in a vacuum, I hope that the agencies will ask, at every stage of these fuller statements, what difference does it make? What will this

[1] I need hardly say that my dissatisfaction is not with Mr. Denison, who had the difficult job of recording points of agreement and disagreement on many complex matters, on the basis of inadequate records, more than a year after the discussions had been held.

omission or addition or change mean in terms of the comparative level of aggregate national income, internal relations among the components of national income, cyclical and secular change in the aggregate and components? If the quantitative importance of each decision is estimated, I think that it will more easily be seen that many a camel has been swallowed while straining at a gnat.

## II

As presently defined by the Department of Commerce, national income includes: A, the value of consumer goods and services purchased by consumers from business enterprises, farm products consumed by their producers, and paid domestic service (including payments in kind); plus B, private net capital formation, including all residential buildings but excluding other consumer durable goods purchased by consumers, unadjusted for inventory revaluations or the difference between current and book value of depreciation charges; plus C, government expenditures; minus D, business taxes. The significance of the deduction of business taxes is noted below.

The Department of Commerce now proposes to redefine national income by making the following changes in its present concept:[2] (1) add to consumers' outlay (Item A, above), (a) income in kind received by the armed forces; (b) imputed net rent on owner-occupied dwellings; (c) the value of 'free' services rendered consumers by banks and other financial institutions; (2) add to private net capital formation (Item B), depletion charges (i.e., include in national income additions to capital gross rather than net of depletion charges); (3) deduct from government expenditures (Item C), the interest paid on the federal debt; (4) reduce business taxes (Item D), by excluding taxes on corporate profits.

The following remarks take the form of comments on the Department of Commerce proposals and on the differences between it and the other agencies.

## III

The first addition to consumers' outlay, the estimated amount of payments in kind to servicemen, would improve the value of

I omit a few changes listed in Mr. Denison's paper.

consumers' outlay as a measure of consumption. Since war outlay would not be reduced by the addition to consumers' outlay, the grand aggregate also would be increased. This would accord with the view that war outlay is a legitimate part of national income. The proposal is therefore to be welcomed for two reasons.

The second change in consumers' outlay would remove an inconsistency from the Department of Commerce's current treatment of owner-occupied residences. The Department of Commerce proposes to follow what most of us would consider the more acceptable path to consistency.

Interest on consumer debt is already included by the Department of Commerce in national income; but it is not to be fully included by the other countries. This item strikes me as rather different from interest on the public debt, to which it is compared in justification of its exclusion. As I do not find the procedure to be followed with respect to interest on government debt a satisfactory substitute for a more rational treatment of the government area, as indicated below, I am skeptical about the value of any analogy. Apart from this, it seems to me that the analogy would be correct only if we could assume that government debt in effect represented borrowing from group A of the population by group B, the interest and principal to be paid by taxes levied on group B. I doubt the validity of such an assumption. The exclusion of imputed rent on consumer durable goods from national income, mentioned by Mr. Denison as possible support for the inclusion of interest on consumer debt,[3] seems to pose an entirely different issue, which would exist even if there were no consumer borrowing, just as the problem of consumer debt would be with us even if there were no consumer durable goods. The real question is whether the nation's economic welfare is raised when people borrow for consumption. To this, I think, the answer must be yes; and, as usual, we measure the increment by its total market value. I agree with the Department of Commerce treatment and feel that the treatment to be followed by Canada (and possibly Britain), in which only the expenses of handling the loans are included in national income, is unacceptable.

[3] It is interesting to compare Mr. Denison's reaction to the assumption that interest on state and local government debt reflects the imputed rent on government property.

As far as I can make out, the change in the treatment of financial intermediaries proposed by the Department of Commerce would mean an increase in consumers' outlay and in national income, to the extent of a part of the cost of banking and other related services. The new procedure would avoid the undesirable changes in national income that may now arise merely, for example, from the establishment or disestablishment of family corporations to handle a family's investments.[4] On the other hand, the proposed way of avoiding these undesirable changes seems to me to be a step backward in the practical solution of the problem of distinguishing between net and gross income. I think we already overstate the former. I would prefer to move in the other direction, that is, subtract brokerage charges, bank service charges, trade union dues, and a large fraction of street car fares and similar expenses of working in cities.

## IV

With the addition of depletion charges in the measurement of private net capital formation, I am afraid I must quarrel too. I agree, of course, that the depletion permitted by current tax laws undoubtedly overstates the amount properly chargeable for the depletion of mines. The solution is then to reduce the amount, rather than to eliminate it entirely.[5] The fact that current discoveries may not be included in gross capital formation is an inadequate reason for the choice suggested by Department of Commerce, since most discoveries were made a considerable time ago. Current (unrecorded) discoveries do not offset current depletion, if there is any truth in the widely held opinion that our mineral and other natural resources are shrink-

[4] Similar undesirable changes may arise because of Kuznets' identification of taxes on corporate profits (in peacetime) with government services rendered business, while peacetime taxes on partnership or sole proprietorship profits are identified with government services rendered consumers. Both are cases of the house-wife paradox.

[5] If depletion in current prices is measured as suggested in my report on *Capital Consumption and Adjustment*, p. 184, then it is necessary to estimate its level for a single year only, figures for other years being derived from that level via changes in mineral output and an appropriate price index. For the base year's estimate, recourse might be had to the published income accounts of mining companies that compute their published profit figures on the basis of rational depletion charges (cf. the Senate Hearings on the Extension of the Emergency Price Control and Stabilization Acts of 1942, held February–March 1945 by the Committee on Banking and Currency).

ing. We must take that shrinkage into account in our estimate of national income.[6] Indeed, an allowance should be made also for the depletion of farm land, if at all possible, though this is less important, in a sense, owing to the relative stability of this type of depletion compared with that of mines and forests.

The Department of Commerce does not propose to change its current treatment of revaluations of inventories and depreciation charges. In this respect it differs from Kuznets' practice, and (with reference to inventories) from the proposal of the other governmental bodies. I think the Department of Commerce is inconsistent in making an adjustment for inventory revaluation in its estimate of gross (and net) national product but not of national income, and (as Kuznets has pointed out) in adjusting for realized capital gains and losses but not for these revaluations.[7] I suspect an inconsistency also in the Department's decision to include emergency and contingency reserves, although at the same time it deducts depreciation on wartime facilities at its full tax value.

## V

Two related problems are involved in the treatment of Item C, the government portion of the final products making up national income, and Item D, business taxes. The first is whether to include in national income only government services to final consumers, excluding government services to business as 'unfinished'; and, having decided to exclude the latter, how to measure them. This is the chief problem in defining Item C. The second problem is what to do with taxes paid by business concerns, Item D. Are these taxes to be treated entirely as a duplicating item that inflates the value of Items A, B, and C, on the ground that these taxes are already represented in national income in the form of government expenditures financed by them; and, if this view is taken, should they not all be sub-

[6] I can recall some talk in Washington a few years ago concerning the desirability of preserving our domestic copper reserves for emergency use and meeting current needs from imports. If these are alternatives, clearly any depletion is a current charge.

[7] In this connection, note the principle reported by Mr. Denison that "adjustments must be made . . . for the failure of actual accounts to reflect real decisions and for the inadequacy or utter lack of actual accounts for a fraction of the economy".

tracted? [8] Or, are these business taxes all to be treated as an income share, seized by government before it reaches the pockets of income recipients, as are personal income taxes today, and therefore — like personal taxes — not to be considered a duplication? Or, is some half-way ground tenable?

So far as I can tell, at present the Department of Commerce includes all services rendered by government in its estimate of national income, on the ground that services rendered to business cannot be estimated separately. The value of these services, including war operations, is assessed at cost (including, in cost, interest on the public debt), and is combined with government capital formation, also assessed at cost, to yield Item C. (Government capital formation is measured by expenditures on government construction and purchases of producers' durable goods, gross of depreciation and exclusive of increase in inventories.) The Department has thus answered in the negative the first question posed above. It has answered the second question by asserting that all business taxes are duplicative and eliminates them by subtraction.

The Department of Commerce now proposes to exclude interest on the federal debt from what we may take to be the measure of government services rendered consumers (the services, together with services rendered business and government capital formation, are included in Item C); and to substitute for total business taxes, Item D, business taxes other than those on corporate profits, as a measure of the duplication claimed. These revisions are obviously prompted by flaws, aggravated by the war, in the old procedures and the assumptions on which they are based. I agree with the Department that the proposed revisions will improve the figures. But should not the Department go the full length of the path of revision it has entered upon; and until it does so, will not the new measures remain at least in part still somewhat arbitrary?

First, with respect to Item C: I think most of us would want to include in Item C (1) some direct approximation of the goods and services provided consumers by government, including free goods; (2) some estimate of government capital formation, net

[8] There could be duplication in Item C, as well as A and B, because governments indirectly pay taxes to one another; e.g., by buying goods from business concerns which pay such taxes.

of depreciation and depletion and including inventories; (3) perhaps some estimate of war outlay. Apparently, in view of its proposed treatment of interest on the public debt, the Department of Commerce would go along with this as a goal. But can we say that the sum of these quantities would in any sense be truly approximated by the Department of Commerce proposal?

I would like to recall a statement that appears in the very first volume of *Studies in Income and Wealth*, and in the first paper of that volume (p. 28). Morris Copeland, its author, wisely repeated this remark in Volume Six (p. 38); and I find it repeated also in Volume Eight (p. 81), by Mr. Liu. Here it is again, in Volume Ten: "The possibility of making accurate estimates of a theoretically untenable item is not an argument for substituting it for a tenable item that can be estimated only roughly." To be quite explicit, I would prefer the complete omission of an item than to see just any old figure put down for it; though I would much prefer some rational, even if rough, estimate of an item to its complete omission. I consider the proposed Department of Commerce figure for government's 'finished' services and capital formation, and that proposed by Canada and Britain, still too close to being 'just any old figure'. If it is felt that publication of the figures cannot be postponed until a real estimate of that portion of the nation's product has been prepared, then let that portion be omitted. Let a total excluding the finished services of government be published. And let it be noted that the published total is incomplete since it does not include any estimate of government services to consumers; that because of difficulties with the basic data, no adequate estimate of these services has yet been derived, but that work on one is proceeding. Perhaps this position is extreme. But it may at least stimulate more discussion!

As for Item D: I am sceptical of efforts to determine what portion of business taxes is duplicative and what is not. The shift in the Department of Commerce's position with respect to corporate income taxes is an indication of the arbitrariness involved in getting away from market values in this case. The usual talk about excises on tobacco products is unconvincing. In some countries the sale of tobacco is a state monopoly, and the 'excise tax' is inseparable from monopoly profits. As a matter of fact, if Item C, the government service and capital forma-

tion portion of the national product, is estimated 'rationally', as I suggest above, a correct decision with respect to business taxes has already been made in part. Business taxes would be treated as the purchase price of services government renders business, to the extent that government uses these taxes to finance such services. The residue, it seems to me, should be considered an income share, used by the government to finance free consumer services, governmental capital formation, or retirement of the public debt. According to this view, there would be no Item D; but there would be an additional income item in the calculation of national income on the income side. If total business taxes should prove to be smaller than government expenditures on services to business (which is unlikely), to bring total national income calculated on the income side into agreement with the total calculated on the product side, the income side would have to include a negative item equal to the difference.[9]

## VI

'National income' and 'net national product' have been used interchangeably in the English and American literature. Once certain preliminary decisions have been made — for example, whether or not to cover the family economy — the terms refer to a unique quantity: the net volume of economic commodities and services available to a nation in a given period, the adjective 'economic' being defined in accordance with the pre-

[9] In either case, or even if total business taxes exactly equaled the value of total government services to business, taxes paid by any particular industry would not necessarily equal governmental services to it. This means that income originating in an industry, as ordinarily calculated, does not necessarily equal the industry's true contribution to national income. Through 'excessive' tax payments, for example, an industry may be subsidizing other industries, as well as consumer services. But this problem is not peculiar to business taxes; it arises also because interest payments to 'associations of individuals' are not a true net income, since their expenses have not been deducted; nor for that matter, as argued above, are wage payments, since trade union fees have not been deducted.

Perhaps a word should be said about government deficits. Because he measures the value of government output (delivered to consumers and to producers) by tax receipts, Kuznets must include on his income side an item for government savings. Because it measures the value of government output by expenditures on goods and services, the Department of Commerce does not require an item for government savings on the income side of its calculations. The position I am setting forth is similar to that of the Department of Commerce, in that government savings need not be taken into account.

liminary decisions. The present proposal, to divorce the two terms and apply them to different quantities, would mean a shift away from the current meaning of at least one of them.

I would hesitate to change the meaning of any currently accepted term, especially in a field where it is difficult enough to get people acquainted even with present meanings, unless there were some real advantages in doing so.

I can see certain advantages in retaining 'national income' in its present usage, and making 'net national product' mean the net volume of economic goods produced in a given national area in a given period. The difference between the two would be currently earned claims to goods produced abroad, minus currently earned claims of other nations to goods produced domestically; that is, the net international balance on income account. But the agreement does not propose this change. Instead, it proposes that net national product equal the proposed national income, plus bad debt allowances, business transfer payments, and business non-income taxes, minus subsidies and inventory revaluations.

I would, myself, put some of these items (each with its proper sign) into national income; others I would exclude from both, thereby bringing national income and net national product to the same level. But I am not interested at this point in arguing the merits of including or excluding certain individual items. My immediate concern is to indicate doubt concerning the usefulness of the proposed distinction between the two terms.

This doubt, in addition to the doubts already expressed about the measurement of national income, makes it difficult for me to see the advantages to be derived from the changes proposed. They would alter the meaning at present attached by members of this Conference to 'national income' and 'net national product'; they would bring the terms no closer to any 'popular' meaning they may have; and, if carried out, they would leave, in my opinion, the basic concept in the field with which this Conference is concerned nameless and innocent of measurement by the three leading official national income units.

## VII

National income, as measured, does not cover the results of all productive activity. The output of the family economy, for ex-

ample, is largely omitted. This being the case, even complete identity of coverage of various categories of production, as well as identical treatment of each, will not ensure full comparability among the national income figures of different countries. The relative importance of the omitted categories will vary from country to country, and accordingly the effective percentage of coverage of total production by the national income figures.

The differences will be greater between countries far apart in their structures of production, their social customs, and their habits of consumption, and less between countries such as Canada and the United States. But I doubt that they would really be negligible in any comparison.[10]

I hope that if and when an agreement is put into practice it will be made clear, even emphasized, that national income figures for two or more countries cannot be assumed to be strictly comparable in all senses merely because they are based on identical categories and concepts. Such identity is by no means a guarantee of strict comparability.

## VIII

I have touched on the more important proposals of the Department of Commerce. I shall not be surprised if my comments strike Mr. Denison and his colleagues and their opposite numbers in the other two agencies as too brief — even too superficial — to be of much value to them. If that is the case, I hope they will realize that that is how Mr. Denison's report strikes me; and that in the absence of more detailed statements by them, nothing more than a brief — and undoubtedly superficial — set of comments is possible.

As a matter of fact, I am not hopeful that there will be any really satisfactory discussion of the proposals before they are acted upon.[11] 'Pressure of other work and geographical dis-

[10] If structures of production, etc. are correlated with levels of per capita income, then comparisons of national incomes, whether or not based on common concepts, are systematically biased, most probably in the direction of overstating international differences.

[11] However, I can imagine that a rather voluminous, even acrimonious, discussion by the general public might develop after the proposals are acted upon. This possibility is certainly one reason, and an important one, why the fullest advance discussion is desirable.

tance' will prevent this, as they prevented the preparation of the paper by Messrs. Stone and Gilbert describing the underlying rationale of the agreements. It has already been indicated that the Department of Commerce is now well advanced in revising its measures in accordance with its proposals. I am hopeful, however, that the Department will advertise in detail to its consumers what is and is not included in its figures, and warn them that they must always consider the relevance of these inclusions and omissions to their specific problems. Indeed, I am hopeful that the Department will make it possible for them to determine in what direction the figures might be off in a particular use, and, even if roughly, how far. This means, of course, the provision by the Department of various alternative data on items that may be treated in more than one way; estimates of omitted items; segregated figures on included items.

It means more, too. Not many consumers of national income figures are in a position to select wisely between alternatives, and to decide what is or is not relevant to their purposes. I hope, therefore, that the Department — and the other two agencies — will not only provide the necessary supplementary data but illustrate their use as well. Indeed, this is something that is desirable no matter how much agreement there may ever come to be on some single 'general measure' of national income. The fact that the agreement includes provision for a plurality of aggregates suggests that simplicity is not considered an essential requirement in government-issued statistics.

## Morris A. Copeland

The international agreement set forth by Mr. Denison marks a long step forward. It is clearly important to have income estimates for the United Kingdom, the United States, and Canada on an approximately common conceptual basis. It is clearly important, too, to recognize unequivocally that the concept of national income must be defined in accounting terms. And it is clearly important to make not only totals but also components comparable. Indeed, in view of the difficulties in attaining complete conceptual comparability for the official totals of the three countries, it is especially important that each country provide

such detail as may be needed to permit special purpose adjustments of official national totals that can be used for international comparisons.

For all these points the tripartite agreement makes suitable provision. All three countries seem to be moving promptly to improve international comparability along these lines, and it is to be sincerely hoped that this movement will continue.

But under present conditions this falls far short of what is needed. Instead of comparability on a three-country basis, there is need for comparability on a 50 or 60 country basis. Despite the technical difficulties inherent in achieving the international agreement described by Denison, it seems clear that this agreement was greatly aided by the close cultural kinship of the three countries that were parties to the agreement. It will be far more difficult to agree upon a global concept of national income that can be closely approximated from the official figures (or for want of these, from the best estimates available) for countries representing upwards of 75 percent of world income. For purposes of such an international standard concept much additional attention will have to be turned to conventions with respect to imputed income. And for the three countries that are parties to the tripartite agreement, there may be need for special segregations of property income and income derived from service enterprises. It may seem ambitious to aim at such an international concept of national income. But we can hardly be satisfied with anything less; and pending international agreement on such a concept, all changes in national conventions of official measurement should certainly be regarded as tentative.

With these considerations in mind two comments may be offered on the specific proposals for changes in the United States figures. One has to do with the modified procedures proposed for property income derived from financial enterprises which are explained by Yntema. For the sake of simplicity, banks may be used as an illustration. The proposal recognizes the double counting involved in the present procedure for banks and would do away with the unrealistic fiction of 'associations of individuals'. In this respect the proposed procedures are distinctly preferable to those followed in the past. They have advantages also from the viewpoint of the United States alone over the

closely related proposal I made some years ago;[12] that is, it is somewhat easier to get separate figures for the income derived from each industry on the basis proposed. But the proposal involves the inclusion in national income of an imputed property return which at the outset and perhaps for some time to come will be unique among nations. In other words, it will add another item to the adjustments that will have to be made in United States figures if they are to be compared with the national incomes of other countries.

Denison's paper emphasizes the importance of various detailed allocations. These undoubtedly need emphasis. But it seems important, too, to avoid unnecessary confusion regarding the total it is proposed to subdivide. There has been confusion in recent years regarding United States figures, because of the competing concepts of national income. This confusion has not been lessened by the Commerce Department procedures, particularly the different bases on which national income and gross national product have been estimated and the prominence given income payments to individuals.

There will be more rather than less need for special purpose concepts of income as time goes on, but it will not be less important, if confusion is to be avoided, to focus attention on one or two basic concepts. For example, it would seem desirable to emphasize chiefly a single national income total and a single gross national product total defined on a consistent basis. It had been hoped that the tripartite agreement would be made the occasion for moving United States procedures in this direction, but it now appears that instead of three United States concepts we may have four.

It seems unfortunate to add to existing confusion. If it is feasible to focus attention on a single national income total and a consistent gross national product, I strongly urge that this be done. But there may be good reasons why a simplification of United States official concepts is not now advisable. If so, I strongly urge that the proposed additional concept be set up as National Income Adjusted for Intercountry Comparability and be designated by some such title rather than adding to confusion by creating a Net National Product.

[12] *Journal of Political Economy*, Feb. 1932, XL, 1–51.

O. C. STINE

While the tripartite agreement suggests several modifications that are definite improvements, it is regrettable that the participants did not arrive at a consensus on some points that remain in confusion. It is regrettable also that it does not contribute more to the simplification of concepts and procedures. It is very confusing to the public to have so many estimates of 'national' income or product. I hope that the participants will reconsider some points, with a view to making compromises where necessary to clarify and simplify concepts and procedures.

The first and most important point I wish to discuss concerns the definition of *national income* and *net national product*. I hope that the representatives of the United States will accept the preliminary usage of the Interdepartmental Committee of the Dominion Bureau of Statistics. Net national product and national income should be synonymous. The distinctions indicated by the United States representatives are not basic, and should be adjusted for the sake of simplification in public use. Furthermore, I would suggest that a modification of phrasing of the concept *income payments to individuals* be considered. The series might be described as 'consumer income', 'receipts of' or 'payments to individuals', and adjusted, if necessary, so that it would be the sum of the receipts of individuals, or of income received as it would be reported in a survey of families and individuals.

*National income*, *net national product*, and/or *consumer incomes* may be analyzed in terms of the contributions of, or returns to, production factors. This is to suggest a shift in emphasis from primary concern with returns to the factors to greater concern with the annual national flow of goods and services and the goods and services annually available to individuals and families, on whatever account.

The agreement proposes some improvements in the treatment of interest. It seems obvious that if interest paid on the national debt is to be classified as a transfer payment, interest paid on the debt of other governmental units also should be classified as transfer payments. I would go further and treat all interest payments as transfer payments. I do not see the logic of not extending the proposed practice for public debt to private

debt. It seems absurd to me to impute interest on all bank deposits as proposed.

The proposition that saving is a public service and that anyone who defers consumption to provide capital earns something might justify the imputation of interest on all capital investments or capital goods. But the figure resulting from such a procedure is of no practical significance. I would adopt the principle that financial institutions, like governments, are service institutions that earn what they cost. Therefore we should include in the national income account the payrolls and other costs of operating all financial institutions, and at the same time treat all interest payments as transfer payments. To complete the coverage of services of those who lend, it will be necessary to devise an appropriate method of imputing the value of the services of individuals and other private agencies not classified as financial institutions. This could be done by applying to such lending a service rate based upon the average cost of the financial institutions.

The principle of valuing physical changes in inventory at year-end prices, or costs adjusted to the year-end price level, should be adopted across the board. The objective, of course, is to account for the new goods and services becoming available in the course of the year, or the net reduction of stocks in relation to what was carried over from the preceding year. If it is impossible to determine the physical quantities, the value figures may be used as a basis for determining the probable changes in volume, which at current prices at the end of the year will approximate the value of the changes in inventory. The degree of inaccuracy that may be inherent in such a procedure seems to me less important than the confusion that arises from treating some sectors of the national economy one way and others differently.

JEROME ROTHENBERG

Mr. Denison explicitly denies that the purpose of the Commerce Department gross national product series is to measure welfare. He claims that the purpose of the Department is to show 'the structure of the national accounts'. This means that the Department of Commerce is trying to avoid any special purpose narrowness in its concept, so that the gross national

product may not be limited in usefulness. For example, a deflated series — which is appropriate to a measure of welfare — may be of little use in questions concerning the servicing of the government debt.

It is indeed doubtful that a series can be 'unbiased' merely because it professes to measure the 'structure of the national accounts'. Are all accounts to be consolidated? Which accounts should be omitted? What is the nature of the accounting theory to be used in consolidating the accounts? The necessity for answering such questions indicates that some arbitrary decisions will be required: the resulting series will not be purely 'objective'.

Perhaps a more important criticism of Denison's position is in the nature of the bias that arises from an attempt to show the 'structure of the national accounts'. Any accounting procedure depends upon what a consolidation of accounts is expected to show, i.e., it depends upon the purpose of the consolidation. In deriving a series such as the gross national product, which cuts across most segments of the economy, it is quite likely that different accounting purposes are met, and hence different accounting procedures applied. If the income estimators uncritically accept each procedure they uncritically accept each purpose. The resulting series will have the conglomerate — and perhaps conflicting — purposes implied in the procedures. Thus, instead of using a tool to perform the specific task for which the tool was fashioned, the Department of Commerce professes its willingness to use any bunch of tools and to take its chance as to what task can actually be accomplished.

These criticisms, while applying to Mr. Denison's — and others' in the Bureau of Foreign and Domestic Commerce, including Milton Gilbert's — pronouncements, are not meant as a criticism of the gross national product series. I do not think that this series measures only the 'structure of the national accounts'. Notwithstanding its *alleged* purpose, I think it approximates a measure of economic welfare. It is evident that neither gross national product nor any other series can measure the total satisfactions arising from the annual national production of goods and services — for no utility calculus has been developed that is cardinally applicable to human experience. The most feasible index, therefore, is that derived from an

estimate of the total stock of goods and services that have conceivably added to the sum of satisfactions during the year; and this total stock should be expressed in terms of a standard that represents an approximation to the magnitude of use-values (the satisfactions derived from the use of a good or service). (No good or service not forbidden by law can be excluded from this stock of 'useful' goods merely because, although it brings satisfaction to some, it is distasteful to others ethically or esthetically: universal satisfactoriness is not a valid criterion for inclusion in national income estimates.) In this regard, and in the absence of direct measurement of satisfaction, the behavioral manifestation of use-value, i.e., the overt action based on the expectation of use-value, can be used as a reasonable first approximation. It is the amount of the standard commodity, money, people are willing to exchange for a unit quantity of any nonstandard commodity: the market price of the commodity. Market price theoretically represents marginal utility to the buyer [13] (in partial equilibrium theory; in general equilibrium theory market price represents the 'marginal rate of substitution' of the commodity for money at that combination of the two, given a budgetary limitation, which maximizes satisfaction).

In the private sector of the economy gross national product *does* measure a total stock of goods and services (except illegal and household products), and these goods and services *are* weighted according to their market prices. Moreover, the special reasons for evaluating government output at cost are not

[13] More exactly, market price equals the marginal utility of the commodity multiplied by the marginal utility of money. This refinement is necessary because the purchasing power of the dollar in terms of satisfactions is not the same at all times, in all places, for all persons, at all price levels, etc. Of these qualifications, the price level is susceptible of adjustment. The series deflated by an appropriate price index will yield a figure indicative of physical quantity. However, the present gross national product series is not deflated. This is a serious limitation of GNP as a measure of welfare. Moreover, GNP does not take into account the consumption of capital equipment during the productive process. But as I do not consider these the essential features of the series, I am taking their omission for granted in the above discussion (thus, my basic argument would be unchanged if a *deflated net* national product series were being discussed). By leaving out of consideration the varying purchasing power of money, and those other — at present unmeasured — factors that determine the marginal utility of money (of which only the distribution of income could conceivably be put into numerical form), I am able to consider market price as equal to marginal utility.

inconsistent with the above discussion. In its *essentials*, therefore, gross national product *is* a measure of welfare (within the limitations of any such measure).

### CLARK WARBURTON

Four questions are raised here concerning the proposed treatment of income from banks: the classification of banks as financial intermediaries; the concept of imputed income on bank deposits; the concept of income originating in the banking industry and elsewhere; and the treatment of banks and financial 'intermediaries' as aggregates of individuals rather than as business concerns.

To treat banks as financial intermediaries is like classifying General Motors or United States Steel as merchants rather than as manufacturing establishments. It implies that bank deposits are something individuals possess and place at the disposal of the banks for lending or investing. This is the reverse of the real situation. Deposits are something banks bring into existence and place at the disposal of individuals and business.

How does the concept of imputed income on bank deposits differ from that of imputed income on the coal in the bins of individuals and business concerns, or of imputed income on the rugs in our houses and offices, and why should it be selected for special consideration? Any possible line of demarcation between items which, as a practical matter, we wish to include or exclude in our measurements is, of course, somewhat arbitrary, but we should, I think, have some reason behind our arbitrariness. I cannot see any more reason for including imputed income on our stockpiles of deposits than on our stockpiles of coal or rugs. But if we do include imputed income on deposits, should we not also include income or interest on our holdings of currency? To include the former but not the latter is like including imputed income on our stocks of bituminous coal but not on our stocks of anthracite coal, or including imputed income on our domestic rugs but not on our orientals.

If we do include imputed income on deposits, why should it be treated as income originating in the banking industry? We might as well attribute imputed income on our floor rugs to the rug-making industry, or imputed income on our bins of coal to

the coal-mining industry. This question leads to a comment on the concept of income originating in an industry, in which, I believe, is inherent a fundamental misconception of economic processes. Under current national income concepts and measurement, the attempt is made to obtain for each industry a net value of its product, which is then labeled as 'originating in' that industry. That is not where the value originates. The value originates in the market; the goods originate in the industry. Take the case of the two publishing firms whose editors have equal judgment. One published a book that is a best seller, perhaps because of some event occurring just before publication; the other, a book that is a failure. The factor costs of the two books, in the sense of the outlay for the acquisition of the production factors, are equal. The difference between this cost and the net value of the product originates in the market, not in the publishing industry; and it is the latter, not the former, that is reflected in national income by industries.

Banks and financial institutions, like other business concerns, are enterprises producing and selling particular types of service — partly to other business concerns and partly to individuals. Why, then, should the services bought from banks and other financial concerns be treated in national income measurement differently from those bought from mining companies or laundries? If a manufacturer, for example, buys coal or laundry service from another concern, the payment is not included in the items added to obtain the net value product of, or income derived from, the manufacturing concern. But if the manufacturer makes a direct payment to an individual for getting coal from underneath the soil to his factory, or for washing his workmen's uniforms and cleaning his office furnishings, the payment is included in the items added to obtain the net value product of, or income derived from, the manufacturing concern. Similar treatment of interest paid would, of course, require an estimate of the amount paid to banks and other financial enterprises, on the one hand, and the amount paid to individuals, on the other. Is the practical problem of making such a division, and the probable error in the estimate, so much more serious than in other phases of national income measurement as to warrant the introduction of a technique that is so roundabout,

complicated, difficult to understand, and divergent from the general methodology as that proposed by Mr. Yntema?

The solution of the problem of handling income from banks and other financial concerns, I believe, lies in replacing the illogical concept of income originating in an industry by the concept of income derived from an industry; and in replacing the present illogical treatment of interest paid to a business concern by the method of treating payments to business concerns for other types of service. Income derived from the banking industry could then be obtained by the same direct process as income derived from other industries: as the sum of wages, salaries, dividends, etc., including interest actually paid on deposits.

## *REPLY*

### Mr. Denison

In examining the comments offered by various members of the Conference, I find that the same points have been made by several discussants. To avoid repetition I shall therefore organize my reply by subjects rather than attempt to reply to each member directly.

### I

Messrs. Copeland, Stine, and Fabricant dislike the establishment of separate series for national income at factor cost and net national product at market prices. Copeland and Stine object primarily on the ground of expediency: that is, they fear that the existence of two series whose levels will be fairly similar will confuse users of the data.

Granting this possibility, I still cannot believe that the proposal can be anything but an improvement over the present condition. In response to a request for the net value of production at market prices, the Department of Commerce must now reply that it has no such series. The inquirer must either subtract depreciation from gross national product or wrongly use gross national product or national income as a substitute. Since I think the net value of total production measured at market prices is perhaps the most important single economic series that can be constructed, I believe the Department has an obligation

to make such a series, net national product, available to the public.

Some critics will ask why we do not then adopt net national product as our basic series and discontinue the national income series. This could be done without dropping the present income-share table by adding to employee compensation, profits, etc., lines to show business taxes, business transfer payments, bad debt allowances, subsidies (as a negative item), and the statistical discrepancy, without showing even a subtotal excluding them.

Despite my own belief that net national product at market prices has greater analytical value than national income when each is viewed as a single series purporting to measure the aggregate value of production, I certainly do not think that the national income series should be discontinued — for two reasons.

First, national income has significance as an aggregate measure of earned income; and, especially important, it provides the appropriate concept for comparison of the net value added by the various industries and of the various types of earned income. In comparing retail trade with other industries, there seems little reason to magnify its importance because many excises chance to be collected at the retail level, or to suppose that the relative importance of retail trade has increased because sales taxes have been widely adopted. Whatever its defects, income originating is by all odds the best available measure of the distribution of economic resources among the various branches of the economy, and it should be made as accurate a tool for this purpose as is possible. Again, while one may wish to know what proportion of the total market value of private production employee compensation constitutes (and this is provided for in our third account), one may also legitimately wish to compare the size or movement of one type of earned income with that of all earned income, and for this purpose the inclusion of business taxes or the exclusion of subsidies is inappropriate.

Second, most British economists who have worked in the national income field, including Richard Stone and J. R. Hicks, as well as at least one prominent American member of this Conference, Albert Hart, consider factor cost superior to market

price as a general measure of the value of production. I disagree with this position both because it seems contrary to what has always been understood by value and because a factor-cost series is not susceptible to deflation by the price indexes ordinarily available. Nevertheless, I think that an official agency should give sufficient weight to the opinions of respected experts to furnish them with the series they consider of primary importance. Furthermore, if it had been necessary to eliminate either the factor cost or the market price measure, rather than to present both, agreement on the presentation of data would have been unattainable at the Washington meetings.

For these reasons I believe it not only justifiable but essential for the Department of Commerce to publish both national income and net national product figures.

Mr. Fabricant, in Part VI of his comments, objects to applying the terms 'national income' and 'net national product' to different series, chiefly on the grounds that they "have been used interchangeably in the English and American literature". As applied to any single writer this is generally true, although modern authors have tended to clarify their meaning by qualifying the terms 'national income' or 'national product' by adding the phrase 'at market prices' or 'at factor cost'. However, some writers, chiefly in England, have used both terms in the sense of what we call 'national income', while others, whatever the estimating technique, have defined their concept like our 'net national product'. The simple fact of the matter is that the two are different concepts, and that the attempt to force them into a single mold has given rise to much pointless discussion over the items to be included in the single aggregate — in particular, whether business taxes should be included. It is evident that there is now no generally accepted meaning of either national income or national product, and agreement among three principal estimating agencies would seem to be one way of progressing toward this goal.

## II

Mr. Fabricant discusses in Section V of his comments the place of government in national income and national product. His discussion is somewhat confusing because he does not argue within the framework of our general definitions. His remarks

about the treatment of government services to business and of business taxes in national *income* are, it seems to me, for the most part, irrelevant in view of our definition of national income: "National income measures the earnings accruing to residents of the country for the participation in production of factors of production they supply . . . national income may be viewed also as a measure of the value of goods and services produced by the economy valued at factor cost".

In filling in the figures required to meet this definition the question of government services to business never arises. Factor income, or cost, is measured directly. Indeed, this avoidance of the whole question of government services to business has been urged as a principal advantage of measuring the value of production at factor cost rather than at market prices.[14]

Indirect business taxes are omitted from national income because they are not considered to be factor income or factor cost. Admittedly, certain taxes are difficult to classify as direct or indirect. But this difficulty in classification is similar to problems encountered throughout national income measurement.

There is no relation whatsoever between the treatment of indirect business taxes and the absence of any problem created by government services to business.

## III

In measuring net and gross national *product* at market prices, consideration of intermediate government services is indeed relevant. If such services exist, and if they can be isolated and their cost measured, I agree with Mr. Fabricant (though some of my colleagues would not) that they should be deducted from government expenditures since they are already embodied in the price of products privately sold. This, it may be noted, implies that the market price of privately produced commodities is less than their cost of production (including profit) in the amount of the factor cost of free government services to business.

Unfortunately, no one has ever furnished a definitive criterion by which such intermediate services can be recognized. This is

[14] However, if one wishes a product allocation of national income, which the Department of Commerce does not propose to make, the question of government services to business reappears in the allocation of factor cost to different products.

not surprising since there is no way of identifying them except by deductive reasoning. Nothing in the way of records can furnish a solution.

It seems self-evident, however, that the following categories of government expenditure, among others, cannot be considered services to business in any relevant sense: (1) all expenditures for national defense and war; (2) all expenditures for health and education; (3) all expenditures for the construction of new buildings, roads, etc., and for durable equipment. The last class of expenditures constitutes capital formation and must be included in national product regardless whether individuals or business ultimately enjoy the benefits of the capital.

It should also be noted that all government services to business for which a specific price is charged, including in particular postal services, water, electricity, gas, and transportation, are now and will continue to be omitted from national product.[15]

To test the possible magnitude of 'government services to business' I have deducted from total government expenditures 1929–45 the three types listed above, other than expenditures for durable equipment for which data were lacking, and found that the residual comprised 4 percent of gross national product.[16] This 4 percent includes general government administration, police and fire protection, welfare and relief activities, recreation, aids to agriculture (noncash), and pensions to government employees as the largest components, together with a host of minor activities. Any thousand individuals sitting down to allocate these expenditures between services to individuals and services to business would inevitably reach one thousand answers, and none could adduce objective criteria to defend his answer against the others. Personally, I think very little of this residual represents services to business, and am convinced that the possible duplication in national product arising from this source is a fraction of 1 percent. But it does not seem to me any

[15] Even this deduction involves a grave statistical problem of consumer allocation. But the problem is purely statistical. The necessary data exist and in theory can be collected. Not so with free government services.

[16] In this calculation I eliminated government interest and payments to farmers from both gross national product and government expenditures, since they are to be excluded from the revised gross national product series. I did not deduct subsidies other than payments to farmers although they will be excluded from our future government expenditures series — which will further reduce the size of this controversial residual.

part of the business of a government agency to engage in such subjective guesswork.

If anyone is 'straining at gnats' I think it is Mr. Fabricant in his suggestion that a national product total excluding government expenditures be published. The problem of intermediate government services is unimportant and no amount of research will lead to a solution more acceptable than simply to let whatever duplication exists remain.

Finally may I point out that our definitions of gross and net national product are deliberately worded to avoid the question of intermediate government services; i.e., they are defined as the market value of private production plus 'government services valued at cost'. I do not emphasize this point, however, because if intermediate services were really important and identifiable, it could be argued that our definitions are inappropriate. It may also be noted that if the government itself is viewed as a final consumer (see note 1 to my report) intermediate government services cannot exist.

## IV

Several comments center about phases of the treatment of interest. Mr. Stine suggests, as an extension of the treatment accorded government interest, that all interest be omitted from national income. The distinction between public and private interest payments rests on the phrase 'participation in production' in the definition of national income — the implication being that private borrowings are used in production while government borrowings are not. This distinction may be somewhat dubious, but the challenge might better be directed to the exclusion of government interest — long a controversial subject — than to the inclusion of private interest. There can, of course, be no question about the inclusion of private interest (in the sense that it is not deducted) in national product at market prices.

Several members have supported my own position, expressed in note 2 to my paper, that the inclusion of interest paid by state and local governments has no justification if federal interest is to be excluded. I am glad to report that the Department of Commerce has now decided to exclude all government interest from national income and national product.

Several members have also registered disagreement with the proposed treatment of banks in national income. While Mr. Yntema will undoubtedly discuss these suggestions in detail, I would like to try to clarify one aspect of the matter.

The Department of Commerce, like the National Bureau of Economic Research, now treats banks as aggregates of individuals, which means that long term interest received by banks is counted as flowing directly to individuals and included in national income. The new method is approximately equivalent to treating banks as aggregates of individuals and businesses, and including in national income only the fraction of the interest they receive, which is credited to individuals. Whether Mr. Copeland, who says that the change will lower national income, or Mr. Fabricant, who says that it will raise it, is correct cannot be readily determined because the conceptual and statistical assumptions underlying the present estimates cannot be unscrambled.[17] Since both Canada and the United Kingdom agreed to follow this procedure, it should not create international incomparability, as Mr. Copeland fears.

With Mr. Fabricant's justification for the inclusion of consumer interest I have considerable sympathy. I could wish, however, that it could be more sharply distinguished from interest on government debt.

## V

Messrs. Fabricant and Stine object to the omission of an adjustment for the revaluation of nonfarm inventories. In reply I can only amplify the statement made in my paper. The Department of Commerce does not believe this adjustment can be made with sufficient accuracy to justify its inclusion in the basic profits series. The Department, taking full advantage of Mr. Fabricant's own work in this field, is, however, well advanced in the preparation of the best estimates of which it is capable, by industries, and these will be made available for general use.

The reason for omitting an adjustment for the revaluation of depreciation, which Mr. Fabricant criticizes, is also statistical.

[17] The main change in the private interest figures will actually come from the direct measurement of the desired interest flows in place of the present inclusion of all long term interest.

This omission is, of course, far less serious from the standpoint of measuring year-to-year changes.

Mr. Fabricant objects to the inclusion of depletion charges in national income, although agreeing that book depletion is meaningless for our purposes. In my opinion depletion is properly included in national income as a net factor income share, part of the economic rent accruing to the factor land. 'Land', in this connection, need not be defined as the 'original and indestructible properties of the soil'. To qualify depletion (like the economic rent portion of net rents, and of corporate and noncorporate net income) for inclusion in national income, it is only necessary that 'land' be 'original', not 'indestructible'. Other reasons for including depletion are stated in the body of my report.

## VI

I concur fully with Mr. Fabricant's caution in his Section VIII against invalid comparisons of the national product of different countries. I think that the argument for uniform procedures among countries in national accounting is not so much to facilitate international comparisons of statistics as to make it possible for students in one country easily to follow the literature and understand the data of another.

## VII

I wish I could agree with Mr. Rothenberg's conclusion that gross national product is a tolerable measure of economic welfare. I do not think that it, or any other Commerce Department series, is such a measure although the national income accounts present most of the available data bearing upon economic welfare. If I were to attempt to derive a series that measures, as well as may be, changes in economic welfare — or rather the 'income' as contrasted to the 'income net of disutility' concept of welfare — I would include only consumption expenditures and current government services to individuals (excluding private and government capital formation and probably war expenditures). To these series I would make numerous adjustments. I would exclude almost all the 'employment expense and personal business' component of the Department of Commerce

consumption expenditure series, as well as transportation to work and many other items. I would put consumer durable goods on a depreciation instead of a purchase basis. I would make some guess concerning the worth of the output of the family economy and add it in. In deflating, I would abandon the price index technique and let a Ford or a beefsteak be counted as of equal value whether used or consumed in Detroit or California, on a farm or in a city. Probably many other adjustments would also come to mind. When I finished, I would have a highly personalized measure of welfare bearing little resemblance to any existing national product or national income series.

Whether any significant comparison of welfare can be made at all between periods in which consumer desires differ so radically as they do between peace and war years, I leave open. Aside from other problems, both the inclusion and exclusion of war expenditures from a welfare measure seem unsatisfactory.

## Mr. Yntema

In response to comments on the treatment of financial intermediaries, I should like to turn first to the brief remarks of Mr. Fabricant who tentatively concludes that the new proposal means an increase in consumers' outlay and national income estimates. This point deserves attention. The outcome, it should be recognized, depends upon the effect of a shift in procedures from the aggregate-of-individuals treatment as applied in the past (including assumptions concerning certain interest flows going to individuals and computations for financial intermediaries) to the proposed treatment. On an a priori basis, we cannot be sure of the effect; it may be in either direction. In turning to statistical findings for an answer, we are certain to be disappointed. True, the new interest estimates, when available, will be different from earlier estimates. Differences, however, will reflect not only changed concepts with respect to the measurement of property income flows but also differences arising from estimation processes. Among the latter, differences in coverage, source materials, and developmental procedures must be mentioned. These can have substantial effects on numerical results, and the task of making adjustments to eliminate such

effects would be complicated and time consuming. Comparison of statistical findings, consequently, will give no better than a rough answer.

Mr. Fabricant raises also the issue of the grossness of the national income concept. In particular, he would classify bank services purchased by individuals among the business expenses of individuals, thereby obtaining a 'netter' national income. Bank services to individuals then become intermediate products, not part of consumer expenditures. While I sympathize with Mr. Fabricant's wish for a more net concept, I find myself compelled to take the opposite stand. There is great difficulty, for example, in establishing a reasonable stopping point short of the final position, which would be after all production costs of individuals, including the replacement of human capital.

Mr. Copeland, in qualifying his acceptance of the proposed methodology, states that the procedure would be unique among nations for some time to come and that adjustment would be required in making international comparisons. In comment, I can only say that the new methods for financial intermediaries will presumably make various details available that should greatly facilitate adjustment for international comparability. Certainly, one must not claim that the old method provided a solution, for it was not generally adopted by other countries, either explicitly or implicitly. Of course, differences between numerical findings under the two methods cannot be large when viewed in the light of inter-country differences in income estimates due both to underlying institutional dissimilarities and to incomparabilities in estimation practices. If the proposed procedure for banking comes to be generally adopted, the treatment of financial intermediaries would be on a sound basis, and comparability among countries with respect to this area would finally be achieved. In the case of the 'other finance' industry, it will of course be necessary to standardize methodology for finer international comparisons. Standardization would preferably be in the form of either some aggregate-of-individuals treatment or the proposed treatment as against the ordinary industry procedure. Most countries, however, do not yet have sufficiently precise national income estimates to warrant adjustment for differences in measuring income originating in financial intermediaries.

The remarks of Messrs. Stine and Warburton raise much more fundamental questions. Mr. Stine prefers to treat all interest payments as transfers, thereby automatically obviating any need for imputation (of services or interest) on bank deposits. Substitution of some service cost figures for financial institutions plus some imputed lending-service cost for individuals and related lenders does not seem to me to be a particularly neat way out of the dilemma, either conceptually or in terms of preparing estimates. I take it that Mr. Stine does not wish to go the whole way, i.e., eliminate all property returns from national income computations. Yet it seems difficult to stop, as Mr. Stine would do, short of the terminal position. In refusing to accept interest as a factor return, Mr. Stine is proposing a change that strikes at the level of things axiomatic to national income work. The question is whether, in our country and times, interest qualifies as a distributive share. In so believing, I must defend myself by resort to expressions used in speaking of axioms and say it is 'self-evident'.

Mr. Warburton's remarks, as I understand them, are directed mainly at establishing the case for an allocation of national income showing the distributive shares returned to individuals by each industry. He would obtain national income as an industry total of distributive share returns to individuals (defined to include quasi-individuals). This stands in contrast to the compilation showing the value of net factor use, industry by industry. If statistical processes are equivalent, the two all-industry totals should, of course, be the same. Differences are at the individual industry level and two questions are pertinent: (1) For most economic study, which industry figure is more useful? (2) Can statistical calculations be made and, if so, how accurately?

Without prejudicing the answer to the first question, which may be considered in its own right, it is only fair to state frankly that statistical calculations by industries under the Warburton proposal are substantially impossible, because we simply do not have the necessary data on property income flows (see note 4 to my paper). Preparation of the required estimates for interest and profits would be little better than sheer guesswork.

Theoretically, the choice is between industry figures showing distributive shares returned directly to individuals as against

figures indicating a value added in the sense of net factor returns. Practically speaking, the two methods give different results only in the case of property returns (interest and corporate profits). As far as I can see, there is little use for the Warburton industrial allocation except for the few cases that are concerned with the industrial composition of individuals' receipts of property income.

The Warburton allocation does not show value added in the sense of the value of an industry's product over purchases from other enterprises, charges for the consumption of capital goods, and business taxes. This total is identical with the income originating total which is comprised of the earnings of resources — labor and capital — used in the industry. And this is the kind of a value measure for an industry that is basic to most appraisals of an industry's position and performance. The merit of the ordinary industrial distribution of national income lies in the fact that it gives a useful industrial allocation. In consequence, I find myself compelled to reject Mr. Warburton's proposal even as a desirable theoretical formulation.

There remains the entire question of imputation in the financial intermediary area. If national income is to be strictly a total of factor returns to individuals that appear in the form of money, then there need be no imputations, such as have been made for wages in kind, net rents of owner-occupied houses, and property returns in financial institutions. As far as financial intermediaries are concerned, this kind of national income total may be obtained by the application of the ordinary industry treatment in the financial areas (with negative income originating totals for banking). The same all-industry total might also be obtained by Mr. Warburton's suggested procedure, were it statistically possible. The result, however, is incomplete as a national income aggregate because some factor returns clearly appear in the form of commodity or service returns or as 'income in kind' rather than in the form of actual money flows. For example, a farm laborer who receives \$20 in cash plus board and lodging worth \$10 is assigned a wage return of \$30, of which \$10 is imputed. Similarly, the home-owner whose house would yield him \$500 in net rent if leased to a tenant will have an imputed net rental return of \$500.

In the banking area the problem is perhaps more complicated, although basically the same. By the aggregate-of-individuals procedure, the flow of long term interest plus dividend income into banks is treated implicitly as if it went directly to individuals. The proposal in my paper envisages a transformation in banks of total interest and dividends received so that these appear in the form of services rendered business and individual depositors (in the amount of property income receipts minus interest paid). In the income compilations, these services are said to be in the form of imputed interest. Judged by fundamental intent, these two approaches are not far apart and failure to impute in the financial area would give an incomplete national income total.

# Part II

## The Nation's Economic Budget
## A Tool of Full Employment Policy

Gerhard Colm
*Council of Economic Advisers*

## Forecasting Gross National Product and Employment during the Transition Period
## An Example of the 'Nation's Budget' Method

Everett E. Hagen
*Bureau of the Budget*

assisted by
Mrs. Nora Kirkpatrick

*COMMENT*

W. S. Woytinsky
*Social Security Administration*

L. R. Nienstaedt

Clark Warburton
*Federal Deposit Insurance Corporation*

Morris A. Copeland
*National Bureau of Economic Research*

Mordecai Ezekiel
*Department of Agriculture*

*REPLY*

Mr. Colm
Mr. Hagen

# THE NATION'S ECONOMIC BUDGET
# A TOOL OF FULL EMPLOYMENT POLICY

GERHARD COLM

## 1 Statistical Data Underlying a Full Employment Policy

DISCUSSION OF A POSTWAR POLICY of full employment, or for that matter of any coherent postwar economic policy, has centered recently around the Murray-Patman full employment bill.[1] If enacted, this bill would express the determination of the United States Government to pursue a policy designed to assure full employment, and would provide for an executive and legislative procedure for the formulation of fiscal and economic policies to that end. The bill itself does not outline a program. Great emphasis is placed upon statistical information the President would place at least annually before Congress as background for his own recommendations of policies and for Congressional deliberation.

Critics have insisted that the statistical information required by the bill cannot be had. I believe that in professional discussion of this problem it is well not to stick too closely to the wording of the bill. The main question is whether it is possible to make an appraisal of economic prospects that can serve as a basis for full employment policies.

Before we can say whether the statistical data needed for the formulation of a full employment policy can be provided we must understand the role a statistical analysis of the national product and national income plays in a policy designed to assure full employment, review the statistical sources and data and the deficiencies for this task, and adopt suitable statistical

[1] S. 380, passed by the Senate on October 1, 1945.

methods and procedures for estimating national income and product for the immediate future.

In this introductory essay I shall submit only some thoughts concerning the first question. Copies of a report dealing with some important aspects of the second question have been distributed. The third is dealt with in subsequent papers.

Obviously data useful for purposes of policy formulation must be such as to admit of conclusions concerning *future* economic conditions. Past and current events are of interest only so far as they are means for deriving conclusions with respect to the future. Obviously also the data must be hypothetical, i.e., we must ask two 'if' questions: How will economic conditions develop if present policies are continued and if certain policies now under consideration are adopted?

Thus the problem boils down to the time-honored question whether we can make statements about prospective developments with reasonable confidence, and whether we can appraise the probable effect of policies now under consideration. The answer is unequivocal: "We must." To deny in principle the possibility of making reasonable statements concerning the probability of future business conditions, and the probable effects of contemplated policies, is tantamount to denying the possibility of any rational action. A prerequisite to the consideration of any policy measure is an appraisal of the probable course of events if it is or is not adopted. All the full employment bill provides in this respect is a specific form and a systematic procedure for such appraisals. The approach contemplated by the full employment bill entails the use of the national production and employment budget, in short, the Nation's Budget.[2]

[2] The bill does not prescribe a specific form for statistical estimates to be included in the national budget. I shall refer for discussion's sake to the form used in the *Budget for the United States Government* for the fiscal year 1946, summarized in the Budget Message, p. xxv, and given in detail in Appendix Table 10, p. 830.

The bill stipulates an estimate of the national income and national production required under conditions of full employment. Estimating the labor force and average output per man — the elements that determine national product under full employment — involves less basic problems than a forecast of business conditions, as long as the projection covers only a short period and aims at an estimate of the approximate order of magnitude. Problems arise, of course, when an attempt is made to divide the total national income and product into components; that is, to present a Nation's Economic Budget as an objective of policy. I shall not deal with this aspect of the Murray bill in this paper.

The skeptics are arguing, first of all, that economists in the past have failed to predict imminent changes in business conditions; especially at the end of the 'twenties to predict the depression of the 'thirties. It cannot be denied that economists and statisticians, with some outstanding exceptions, have fallen down in critical situations despite the effort and money spent on business forecasts. I believe it can be shown that the failures were due to the methods, and that we can learn from the mistakes.

## 2 Past Bases of Forecasts

General economic forecasts have been based mainly on two methods: (1) extrapolations of past trends; (2) use of economic 'barometers'. Both methods made use of 'symptoms', i.e., economic series that represent, rather than directly measure, economic transactions statisticians attempt to portray. Symptoms were used perforce, because only a few over-all statistical data were currently available. Estimates of aggregates of economic transactions, such as national income, investments, consumers' expenditures, used to become available only years after the end of the period.

*Extrapolations of Past Trends*. The compilation of single-line economic indices over a period temptingly suggests that the 'trend' will continue into the future. The 'New Era' of the 'twenties was dominated by an optimistic belief in continuing 'natural' progress, although it was recognized that actual development proceeded in the form of fluctuations around the trend line. It was believed that these fluctuations followed regular patterns, so that forecasts could be made by extrapolating the trend as well as the cycle. This interpretation was based on the belief that, within certain margins, balanced economic expansion would naturally continue — without the aid of any specific policies. Discussion of a popularly supported full employment bill is in itself evidence that continuing and balanced economic expansion is no longer taken for granted, and that public policy can either hinder or promote economic expansion and can aggravate or iron out economic fluctuations.

*Use of Economic 'Barometers'*. Prediction on the basis of economic barometers was a much more sophisticated approach than the extrapolation of trends. Many of the economic barometers,

particularly the 'Harvard Barometer', used three indices designed to reflect speculation, business transactions, and interest rates. These barometers were devised on the basis of experience during a certain period of observation. It was found that speculation, as reflected in the stock market, often preceded an upturn or downturn in business conditions; that an increase in interest rates often indicated the end of prosperity while a reduction in interest rates during a depression presaged recovery. A change in speculation may precede a change in business conditions either because speculators are accurate in their predictions or because they reflect optimism and pessimism, which are causal factors affecting business conditions. There is evidence that speculation has actually sometimes foretold business conditions to some extent, but the ups and downs of speculation are much too erratic to indicate the intensity and duration of the business fluctuations to follow.

Furthermore, speculators have recently become accustomed to anticipate government policies that may be adopted more than to study the business outlook. So far as speculation anticipates the adoption of new government policies, it is obviously impossible to use barometers based upon speculation for predicting what the course of business conditions will be if the government policies under consideration are not adopted. When speculators look to Washington for guidance, it does not make much sense for Washington to be guided by the behavior of speculators. As a matter of fact, several investment services are now using methods for analyzing and predicting business conditions similar to those implied in the approach of the Murray bill.

The use of an index of money rates is predicated on a theory that overrated the causal force of changes in interest rates on business conditions in general. A low interest rate may stimulate business conditions if other conditions are favorable; it may fail if other conditions are unfavorable.

Business forecasts on the basis of economic barometers can be valid for limited periods at best, and one is seldom aware in time of basic changes that invalidate the use of a specific barometer. The study of symptoms is valuable, but their significance in relation to the basic economic structure must continuously be checked.

## 3 The Nation's Economic Budget as a Basis for Forecasts

An analysis of economic conditions based on the Nation's Economic Budget uses a much broader theoretical approach than trend extrapolations and barometer analyses. Based upon an analysis of economic flows it is focused on the dynamic elements, particularly the factors determining investment and saving. The emphasis on economic flows by no means precludes attention to profit expectations and the relation of prices to wage rates, interest rates, and other cost factors. These relations are especially important in examining the investment outlook.

The Nation's Economic Budget simply presents gross national income and gross national expenditures in the two columns of a national ledger. The totals of both sides must, of course, be equal. National income and national expenditures are allocated to consumers, business, international transactions, and government. For each category, income and expenditures are not equal, the difference being net savings or the absorption of savings. This presentation not only affords a check on the estimates but also shows the interrelation between transactions of consumers, business, and government.

The presentation of the most recent data of the Nation's Budget facilitates analysis of the economic outlook even though we may not yet be ready to make reliable numerical projections.

The Murray bill emphasized the need for projections of the Nation's Budget. I believe it is more important to present, first of all, the most recent data. Aggregates as depicted in the Nation's Budget are now being estimated currently with approximate accuracy.[3]

An analysis, say, of business investments in producer durable goods in relation to consumers' expenditures, or of investment in inventories in relation to aggregate sales, will indicate whether the components of the Nation's Budget are in such a

[3] It is significant that the 1946 Budget of the United States Government, published early in January 1945, presented the Nation's Budget for the full calendar year 1944. At the time of publication not all data needed were available; some were based upon Department of Commerce forecasts. It is remarkable that these partly estimated data differed only slightly from the actual data published several months later. The Review of the 1946 Budget, released August 2, presents an estimate of the Nation's Budget covering the fiscal year ending June 30, 1945. (The 1947 Budget, transmitted in January 1946, presented the same data through December 1945.)

relation that a continuation or a change in the rate of business investment or inventory movements can be expected. The direction if not the quantity of the expected movement can be predicted. Personally, I believe that a skillful interpretation of the Nation's Budget of the past and present is a useful tool for policy formulation, even without a complete numerical projection into the future.

Numerical projections are by no means impossible in principle, but before they can be made with a sufficient degree of reliability statistical sources must be developed further. The next paper deals with the details of sources and procedures for budget projections. I shall confine my discussion to the general principles of Nation's Budget projection.

## 4 Forecasting the Nation's Economic Budget

To proceed from estimates of the Nation's Economic Budget for the most recent past to those for a future period, three steps are necessary.

The estimator must first determine what changes in basic items he expects even if general economic conditions remain the same. He may expect, for example, a decline in governmental expenditures. Such a decline will be estimated on the basis of assumptions with respect to the necessities of occupation and the speed of demobilization. He will also estimate business investments in plant and equipment for which business men have made their plans. An analysis of inventories may suggest that business will replenish inventories during the coming year. An analysis of foreign demand and plans for international capital transactions may give a basis for estimating the increase in international transactions. All these are 'primary' changes — some reducing, some increasing economic transactions. Changes determined either by noneconomic factors or by business conditions of the past, they are the chief factors determining changes in business conditions in the future.

The estimator must next estimate the effect of these primary changes on gross national product and disposable income, which gives him a basis for estimating the effect of these changes on consumers' expenditures and results in an estimate of 'secondary' changes.

The estimate proceeds from measuring the effect of primary changes on the gross national product. By considering corporate taxes and corporate savings, the estimator obtains a tentative estimate of changes in incomes received by individuals. By considering individual income taxes he derives changes in disposable income. From the past relation between consumers' expenditures and disposable income, a first estimate of secondary changes will be obtained.

The tentative figure for consumers' expenditures, calculated from past relations, will be modified to take account of special conditions. It must be considered whether and how consumers' behavior will deviate in the coming years from their behavior in the past. Deferred demand and accumulated war savings are likely to give expenditure patterns, which, at least for a transitory period, will be substantially different from those of the past. Surveys of consumers' attitudes concerning the use of savings and similar information can serve as a basis for modifying the tentative expenditure figure.

By adding the tentative estimates of governmental expenditures, business investments, and consumers' expenditures, a first approach to the projected Nation's Economic Budget is obtained. A further modification is needed before the results can be regarded as final. Changes in business investments and governmental expenditures were assumed in our example to be in the nature of 'primary' changes; i.e., changes that determine future business conditions rather than changes determined by them. As a matter of fact, all types of expenditure, whether governmental expenditures or business investments, may show primary changes and at the same time respond to general business changes, that is, be subject also to secondary changes. Therefore, adjustments are necessary to take account of these modifying secondary influences. If it is found that business men plan to increase their investments and that other factors are expected to cause a slump in general business conditions, business men may modify their original plans and cancel some of their plans for expansion, or they may cut down on the inventory accumulation that would have taken place had no change in economic conditions arisen.

In this third step all the estimates of the components of the Nation's Budget are adjusted in order to assure consistency.

The need for such adjustments arises from the interdependent nature of our economic system. It cannot be denied that this step introduces an element of judgment and possible controversy in economic projections. On the other hand, these adjustments will usually affect only the size of the projected change, not the basic direction.

The greatest deficiencies for purposes of national budget projections are probably in data on:

The labor force, particularly the factors that induce people to enter into or withdraw from the active labor force;

Labor productivity in various industries;

The distribution of income and savings;

Consumers' expenditures, savings, and dissavings by income brackets, particularly changes due to changes in incomes;

Attitudes of consumers under various business conditions;

Business investment plans, definite and tentative (the latter being subject to change, depending on business conditions);

Current and prospective activities of state and local governments.

In many fields data are available but need improvement, as, for instance, expenditures and revenues of state and local governments; information concerning business inventories of various types; residential construction; foreign loans. With the present sources of information, only the most tentative projections can be made, indicating the general direction of probable investment rather than exact quantities.

Changes in economic and fiscal policies are regarded as 'primary' factors. The projection should always be made twice — once assuming continuation of present policies, and again assuming that policies under consideration will be adopted. There can be a great variety of combinations with respect to policy assumptions.[4] Budget projections can be regarded as a method of appraising the need for and effect of various governmental policies in terms of their economic repercussions.

[4] Projections based on alternative policy assumptions for accomplishing full employment have come to be known as economic 'models'.

## 5 Conclusion

It is possible, on the basis of current data on the Nation's Economic Budget, to make statements concerning prospective economic conditions that can serve as a basis for planning economic and fiscal policies. Numerical projections of the Nation's Budget are still subject to considerable 'judgment' and, on the basis of available data, to substantial margins of error, and should, if made at all at this time, be re-examined and revised at least quarterly. The margin of error is especially large at a time when the economy is in the process of demobilization and when consumers and business, with large deferred demand and large accumulated savings, may behave quite differently than they have in the past. Statistical sources, particularly for consumers' expenditures and business investments, require further improvement. With improvement in statistical data, numerical projections of the Nation's Economic Budget will become feasible. They will greatly facilitate the formulation of a rational fiscal and economic policy. However, a national policy need not await such refinements. If only tentative statements concerning the direction of change in the level of business activity can be made at this time, it will be necessary to re-examine the programs of economic and fiscal policy and to revise them in the light of a changing economic outlook.

# FORECASTING GROSS NATIONAL PRODUCT AND EMPLOYMENT DURING THE TRANSITION PERIOD
# AN EXAMPLE OF THE 'NATION'S BUDGET' METHOD

EVERETT E. HAGEN

*Assisted by*

MRS. NORA KIRKPATRICK

## 1 INTRODUCTION AND SUMMARY

THE PURPOSE OF THIS PAPER is to illustrate a method of forecasting gross national product, employment, and unemployment. During 1945 the writer, as chief of the Fiscal Policy and Program Planning Division of the Office of War Mobilization and Reconversion, obtained from various economists 'projections' of output, income, and employment during the transition period. Using these judgments as points of reference, two projections concerning the period to mid-1947 — referred to in this paper as 'more' and 'less favorable' — were prepared immediately after VJ Day. Of the judgments received, few lay outside the range of estimates spanned by these two projections.

The two projections are presented in Tables 1 and 2, and actual data are presented in Table 3 for comparison.[1] The more favorable projection, the most probable single forecast, greatly overestimates the level of unemployment up to the date this introduction was written (February 1946) for three main reasons:

The possibility that many demobilized members of the armed forces would 'take a rest' before seeking work was overlooked. Since November 1945 the civilian labor force has been temporarily reduced by between 1.5 and 2.0 million persons on this account alone, and unemployment has presumably been reduced by a smaller amount. In addition, the speed of withdrawal of other war-workers from the labor force was underestimated somewhat.

[1] After completion of this manuscript, data through the first half of 1946 were inserted in Table 3.

TABLE 1

## Expenditures for Gross National Product: More Favorable Projection

| | 1940 | 1945 1st Half | 1945 6/30–8/15 | 1945 8/16–9/30 | 1945 4th Q | 1946 1st Q | 1946 2nd Q | 1946 3rd Q | 1946 4th Q | 1947 1st Q | 1947 2nd Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ANNUAL RATES, SEASONALLY ADJUSTED (billions of first-half-of-1945 dollars) | | | | | | | | | |
| Gross national product | 124.4 | 206.2 | 199.4 | 180.5 | 164.6 | 161.8 | 165.2 | 166.3 | 166.6 | 169.0 | 171.1 |
| Government expenditures | 21.0 | 100.7 | 92.4 | 73.5 | 55.5 | 49.0 | 43.5 | 40.2 | 35.2 | 32.7 | 30.7 |
| Federal war expenditures | 3.4 | 87.0 | 78.1 | 58.4 | 39.7 | 32.6 | 26.5 | 22.5 | 17.0 | 14.0 | 11.5 |
| Federal nonwar expenditures | 9.4 | 6.3 | 6.8 | 7.5 | 8.0 | 8.3 | 8.6 | 8.9 | 9.2 | 9.4 | 9.7 |
| State & local expenditures | 8.2 | 7.4 | 7.5 | 7.6 | 7.8 | 8.1 | 8.4 | 8.8 | 9.0 | 9.3 | 9.5 |
| Private capital formation | 18.0 | 4.5 | 6.0 | 8.9 | 12.8 | 13.3 | 17.1 | 19.6 | 22.2 | 24.1 | 25.9 |
| Construction | | | | | | | | | | | |
| Nonfarm residences | 3.1 | .5 | .6 | .6 | .8 | 1.1 | 1.6 | 2.1 | 2.7 | 3.4 | 3.9 |
| Other, private | 2.5 | 1.5 | 1.7 | 1.7 | 2.0 | 2.2 | 2.5 | 3.1 | 3.5 | 3.9 | 4.2 |
| Producer durable equipment | 7.5 | 4.4 | 4.8 | 5.2 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 11.5 |
| Net inventory change | 3.1 | –.7 | . | 2.0 | 4.0 | 2.0 | 3.0 | 3.0 | 3.0 | 2.5 | 2.5 |
| Net exports | 1.8 | –1.2 | –1.1 | –.6 | 0.0 | 1.0 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
| Consumer expenditures | 85.4 | 101.0 | 101.0 | 98.1 | 96.2 | 99.5 | 104.6 | 106.5 | 109.2 | 112.2 | 114.5 |
| Durable goods | 10.6 | 7.2 | 7.4 | 8.6 | 9.0 | 10.5 | 13.0 | 14.5 | 16.0 | 17.0 | 18.0 |
| Nondurable goods | 46.8 | 62.0 | 61.8 | 58.9 | 57.7 | 58.2 | 58.9 | 58.5 | 58.6 | 60.0 | 60.4 |
| Services (excl. rent) | 20.5 | 25.8 | 25.8 | 24.6 | 23.5 | 24.8 | 26.6 | 27.4 | 28.4 | 28.9 | 29.7 |
| Rent | 7.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.1 | 6.1 | 6.2 | 6.3 | 6.4 |
| Disposable income | 93.8 | 139.6 | 136.5 | 127.5 | 119.9 | 120.9 | 122.5 | 121.7 | 121.8 | 124.8 | 125.9 |
| | | EMPLOYMENT AND LABOR FORCE (millions) * | | | | | | | | | |
| Civilian employment | 46.3 | 51.6 | 50.8 | 49.0 | 46.1 | 46.5 | 49.4 | 50.4 | 51.1 | 52.0 | 52.5 |
| Armed forces | .6 | 12.2 | 12.2 | 11.8 | 10.8 | 8.2 | 5.3 | 3.8 | 3.4 | 3.2 | 3.0 |
| Unemployment | 7.7 | .8 | 1.1 | 3.1 | 6.3 | 8.1 | 7.4 | 7.4 | 6.7 | 5.9 | 5.6 |
| Labor force | 54.6 | 64.6 | 64.1 | 63.9 | 63.2 | 62.8 | 62.1 | 61.6 | 61.2 | 61.1 | 61.1 |

* These data are conceptually comparable with the *Monthly Report on the Labor Force* data up to June 1945. They are not comparable with the new *MRLF* series which begins in July 1945. In comparing them with the old series, it must be remembered that they are seasonally adjusted, whereas published *MRLF* data are not. See Table 3 below.

## Table 2

### Expenditures for Gross National Product: Less Favorable Projection

| | 1940 | 1945 1st Half | 1945 6/30–8/15 | 1945 8/16–9/30 | 1945 4th Q | 1946 1st Q | 1946 2nd Q | 1946 3rd Q | 1946 4th Q | 1947 1st Q | 1947 2nd Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ANNUAL RATES, SEASONALLY ADJUSTED (billions of first-half-of-1945 dollars) | | | | | | | | | | |
| Gross national product | 124.4 | 206.2 | 199.4 | 180.5 | 164.5 | 161.8 | 164.0 | 163.0 | 160.3 | 160.0 | 159.6 |
| Government expenditures | 21.0 | 100.7 | 92.4 | 73.5 | 55.5 | 49.0 | 43.5 | 40.2 | 35.2 | 32.7 | 30.7 |
| Federal war expenditures | 3.4 | 87.0 | 78.1 | 58.4 | 39.7 | 32.6 | 26.5 | 22.5 | 17.0 | 14.0 | 11.5 |
| Federal nonwar expenditures | 9.4 | 6.3 | 6.8 | 7.5 | 8.0 | 8.3 | 8.6 | 8.9 | 9.2 | 9.4 | 9.7 |
| State & local expenditures | 8.2 | 7.4 | 7.5 | 7.6 | 7.8 | 8.1 | 8.4 | 8.8 | 9.0 | 9.3 | 9.5 |
| Private capital formation | 18.0 | 4.5 | 6.0 | 8.9 | 12.8 | 13.2 | 16.3 | 17.2 | 18.3 | 19.5 | 20.7 |
| Construction | | | | | | | | | | | |
| Nonfarm residences | 3.1 | .5 | .6 | .6 | .8 | 1.1 | 1.4 | 1.6 | 2.0 | 2.5 | 3.0 |
| Other, private | 2.5 | 1.5 | 1.7 | 1.7 | 2.0 | 2.1 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 |
| Producer durable equipment | 7.5 | 4.4 | 4.8 | 5.2 | 6.0 | 7.0 | 8.0 | 8.5 | 9.0 | 9.0 | 9.0 |
| Net inventory change | 3.1 | –.7 | .. | 2.0 | 4.0 | 2.0 | 2.5 | 2.0 | 1.5 | 1.5 | 1.5 |
| Net exports | 1.8 | –1.2 | –1.1 | –.6 | 0.0 | 1.0 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
| Consumer expenditures | 85.4 | 101.0 | 101.0 | 98.1 | 96.2 | 99.6 | 104.2 | 105.6 | 106.8 | 107.8 | 108.2 |
| Durable goods | 10.6 | 7.2 | 7.4 | 8.6 | 9.0 | 10.5 | 13.0 | 14.5 | 15.0 | 15.0 | 15.0 |
| Nondurable goods | 46.8 | 62.0 | 61.8 | 58.9 | 57.7 | 58.2 | 58.7 | 57.9 | 57.8 | 58.5 | 58.4 |
| Services (excl. rent) | 20.5 | 25.8 | 25.8 | 24.6 | 23.5 | 24.8 | 26.4 | 27.0 | 27.8 | 28.0 | 28.4 |
| Rent | 7.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.1 | 6.1 | 6.2 | 6.2 | 6.3 | 6.4 |
| Disposable income | 83.8 | 139.6 | 136.5 | 127.5 | 119.9 | 120.9 | 122.0 | 120.4 | 118.8 | 120.0 | 119.9 |
| | EMPLOYMENT AND LABOR FORCE (millions) * | | | | | | | | | | |
| Civilian employment | 46.3 | 51.6 | 50.8 | 49.0 | 46.1 | 46.5 | 49.0 | 49.3 | 49.0 | 49.1 | 48.8 |
| Armed forces | .6 | 12.2 | 12.2 | 11.8 | 10.8 | 8.2 | 5.3 | 3.8 | 3.4 | 3.2 | 3.0 |
| Unemployment | 7.7 | .8 | 1.1 | 3.1 | 6.3 | 8.1 | 7.8 | 8.5 | 8.8 | 8.8 | 9.3 |
| Labor force | 54.6 | 64.6 | 64.1 | 63.9 | 63.2 | 62.8 | 63.1 | 61.6 | 61.2 | 61.1 | 61.1 |

* See note to Table 1.

TABLE 3

## Expenditures for Gross National Product: Actual Data[a]

| | 1945 | | 1946 | | 1945 | | 1946 | |
|---|---|---|---|---|---|---|---|---|
| | 3rd Q | 4th Q | 1st Q | 2nd Q | 3rd Q | 4th Q | 1st Q | 2nd Q |
| | ANNUAL RATES, SEASONALLY ADJUSTED | | | | | | | |
| | (billions of current dollars) | | | | (billions of first-half-of-1945 dollars) | | | |
| Gross national product | 198.2 | 185.2 | 182.2 | 189.6 | 195.4 | 179.1 | 174.4 | 176.7 |
| Government expenditures | 81.0 | 57.2 | 39.1 | 36.0 | 79.6 | 52.7 | 34.5 | 30.2 |
| Federal war expenditures | 66.4 | 42.6 | 23.7 | 19.0 | | | | |
| Federal nonwar expenditures | 6.6 | 6.7 | 7.1 | 8.5 | | | | |
| State & local expenditures | 7.9 | 8.0 | 8.2 | 8.5 | | | | |
| Private capital formation | 11.2 | 15.0 | 22.2 | 31.6 | 11.1 | 14.9 | 21.0 | 28.6 |
| Construction | 2.8 | 3.6 | 6.4 | 7.7 | 2.7 | 3.4 | 5.8 | 6.8 |
| Producer durable equipment | 6.7 | 8.3 | 9.5 | 12.0 | 6.7 | 8.3 | 9.2 | 11.1 |
| Net inventory change | .3 | .8 | 2.7 | 4.5 | .3 | .8 | 2.6 | 4.3 |
| Net exports | 1.4 | 2.4 | 3.7 | 7.4 | 1.4 | 2.4 | 3.4 | 6.4 |
| Consumer expenditures | 106.0 | 113.0 | 120.9 | 122.0 | 104.7 | 111.5 | 118.9 | 117.9 |
| Durable goods | 7.4 | 9.0 | 11.6 | 13.0 | | | | |
| Nondurable goods | 65.1 | 70.6 | 75.1 | 74.0 | | | | |
| Services | 33.5 | 33.3 | 34.2 | 35.0 | | | | |
| Disposable income | 137.9 | 136.9 | 138.0 | 141.8 | 136.2 | 135.1 | 135.7 | 137.0 |
| | EMPLOYMENT AND LABOR FORCE (millions)[b] | | | | | | | |
| Civilian employment | 49.8 | 49.5 | 51.2 | 52.9 | | | | |
| Armed forces | 11.9 | 8.8 | 5.0 | 3.3 | | | | |
| Unemployment | 1.3 | 2.0 | 2.7 | 2.6 | | | | |
| Labor force | 63.0 | 60.3 | 58.9 | 58.8 | | | | |

[a] Output and income data in current dollars are Department of Commerce estimates as of December 30, 1946; deflated data in 1944 dollars, by John Kendrick, were shifted to first-half of 1945 prices.

[b] These data are derived from *Monthly Report on the Labor Force* data. Quarterly averages were derived by interpolation between *MRLF* dates. Rough unofficial adjustments were made to allow for seasonal factors and to put *MRLF* data on a level comparable with the old *MRLF* series, i.e., prior to July 1945, on which the projections were based.

Workers were retained by consumer durable goods industries during the reconversion period — presumably stimulated in part by the fact that until the end of 1945 corporations in excess profits tax brackets could increase their expenditures for labor at a net cost after taxes of only 14.5 percent of the wage bill paid. Employment during the last quarter of 1945 was probably underestimated by not far from one million on this account.

The rise relative to income in consumer expenditures for nondurable goods, especially food, after VJ Day was seriously underestimated.

There were other less important (and in part offsetting) sources of error. The first two are temporary, the third of uncertain duration, and possibly permanent. Largely because of it (and because of the multiplier effect upon income and output) the projected estimates of unemployment will almost certainly considerably overstate the actual level between February 1946 and mid-1947, the terminal date of the forecasts.

These errors are not due, in my judgment, to the method. The projections are therefore presented in the belief that the inaccuracies of forecast do not decrease the value of the paper as an exposition of a method — but rather serve as a warning of pitfalls that must be guarded against.

Though the projections have been referred to above as forecasts, the term is inaccurate in two respects. First, the estimate of governmental expenditures for goods and services does not include any allowance for extraordinary expenditures undertaken to relieve unemployment, since one purpose of the estimates was to show whether any such expenditures might in fact be needed. Second, the unemployment estimate was designed to measure the slack in the economy rather than to forecast recorded unemployment. Had unemployment risen as the projections indicate, productivity would probably have decreased (more than the amount reflected in the estimates) as a result of the private boondoggling which tends to increase with unemployment, such as door-to-door selling, subsistence farming, and the opening of small service shops by persons who would otherwise be unemployed. For this reason the estimates of unemployment are not conceptually entirely comparable with unemployment as recorded by the *Monthly Report on the Labor Force*. Under the conditions forecast, the estimates presented here would be higher than *MRLF* would show.

The method used in making the projections is essentially the one presented by Arthur Smithies in his article, 'Forecasting Postwar Demand'.[2] Total expenditures for goods and services for each period were divided into two groups, autonomous and induced. The autonomous were those which in that period were judged to be insensitive to the level of gross national product or that could be estimated, to a first approximation, independently of the precise level of gross national product; they are not necessarily autonomous in any causal sense. The induced are those which were to be estimated primarily from the level of gross national product. A function was derived relating the induced expenditures to the level of gross national product (hence implicitly relating them to the level of autonomous expenditures); from this function and the estimate of autonomous expenditures, gross national product was estimated. Civilian employment was then estimated on the basis of estimates of productivity and hours of work. Finally, the labor force and the level of unemployment were estimated, taking into account the influence of the level of demand for labor upon the size of the labor force.

Consumers' expenditures, except on durable goods and rent, were considered to be a function of individuals' disposable income. Disposable income in turn was derived as a function of gross national product under assumed changes in tax structure and unemployment benefit payments.

Governmental expenditures for goods and services, assumed to be the same as in peacetime but expanding after the war, including interest on the public debt, plus the continuing war expenditures on goods and services, were estimated independently of the level of gross national product. Business expenditures for private capital formation, although dependent in part on the general level of business activity and subject to many other specific influences were treated as autonomous factors.

## 2 Consumers' Expenditures

The first step in computing consumers' expenditures on goods and services was to derive functions relating disposable income

[2] *Econometrica*, January 1945, pp. 1–14.

to gross national product.[3] For each half year, July 1945 to July 1947, three levels of gross national product were assumed: $140, $160, and $180 billion. For each level the corresponding disposable income was computed and a linear function determined by the three points. The estimates of disposable income for each level of GNP were computed by the appropriate deduction from or addition to GNP of the items discussed below:

Corporate profits before taxes were assumed to bear the same linear relation to gross private product during the reconversion period as in 1929–44. (Income originating in government, i.e., wages and salaries of government employees (including the armed forces) plus interest on the public debt, was estimated for each half year and subtracted from gross national product to give gross private product.)

Corporate profits taxes were computed from corporate profits on the basis of wartime experience.[4]

Federal excises and customs were computed on the assumption that wartime excise tax rates would be lowered to their 1942 levels effective February 1946, and effective in 1947 would be further lowered to reduce their yield by $1 billion at the level of $140 billion income payments. Tax returns at the 1942 rates are a function of consumers' expenditures and, therefore, of disposable income.

Business reserves were assumed to remain at 1945 levels minus $.1 billion for each reduction of $5 billion in GNP, plus tax refunds.

Transfer payments include war transfer payments to individuals, such as mustering out pay and dependency allowances, and nonwar transfer payments to individuals, including unemployment benefits. Unemployment benefit payments were computed at $500 per person unemployed, the number unemployed at each level being calculated in the manner explained below.

Corporate undivided profits were computed by assuming that they were 50 percent of total profits after taxes when profits were $8 billion or over and progressively less than 50 percent as profits after taxes fell below $8 billion.

[3] This relation was derived by Bureau of the Budget technicians, who cooperated in all other phases of the estimates also.

[4] It was assumed that the excess profits tax would be reduced to 65 percent effective in 1946 and repealed together with the provision for carryback effective in 1947.

Contributions to social insurance funds at each level of gross national product were estimated by members of the Federal Security Agency staff.

Federal personal taxes and nontax payments were computed for each level of gross national product by assuming that the 'normal' tax would be repealed effective in 1946 and that surtax rates would be lowered sufficiently, effective in 1947, to reduce the yield $2.5 billion (or about 15 percent) at a $140 billion level of income payments. This reduction in yield was estimated to be equivalent to that which would be caused by a reduction of 5 percent in each surtax rate.

State and local personal taxes and nontax payments were assumed to remain at 1945 levels.

The data resulting from these computations are presented in Table 4. (They are now out of date in many respects.) From them the following equations relating disposable income of individuals to gross national product were derived ($Y_d$ = disposable income):

| | |
|---|---|
| 1945, 2d half | $Y_d = 41.8 + .475$ GNP |
| 1946, 1st half | $Y_d = 45.2 + .468$ GNP |
| 1946, 2d half | $Y_d = 43.0 + .473$ GNP |
| 1947, 1st half | $Y_d = 35.4 + .523$ GNP |

Using data for 1929–40, technicians of the Business Statistics Unit of the Department of Commerce computed the relation between consumers' expenditures and disposable income shown here. Data are expressed in billions of dollars ($T$ = the year in question).

Consumers' expenditures on nondurable goods $= 3.51 - .095\ (T - 1935) + .427\ Y_d$
Consumers' expenditures on services excl. rent $= 4.04 - .003\ (T - 1935) + .2\ \ Y_d$

Substituting in the equations relating disposable income to gross national product, we get the following equations:

| | | |
|---|---|---|
| 1945, 2d half | Expenditures on nondurable goods and services | $= 34.7 + .298$ GNP |
| 1946, 1st half | " " " " " " | $= 36.9 + .294$ GNP |
| 1946, 2d half | " " " " " " | $= 35.5 + .297$ GNP |
| 1947, 1st half | " " " " " " | $= 31.3 + .329$ GNP |

These equations describe normal consumers' expenditures on nondurable goods and services other than rent as a function of gross national product during this period. Variations from the normal pattern during the transition were treated as autonomous factors. During the war expenditures on services were far below 'normal', $6 billion less than in the first half of 1945. It

TABLE 4

## Relation between Gross National Product and Disposable Income

By half years, July 1945–June 1947 (billions of first-half-of-1945 dollars, annual rates)

| | 1945 | | | 1946 | | | | | | 1947 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SECOND HALF | | | FIRST HALF | | | SECOND HALF | | | FIRST HALF | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| 1 Income from GNP | 140.0 | 160.0 | 180.0 | 140.0 | 160.0 | 180.0 | 140.0 | 160.0 | 180.0 | 140.0 | 160.0 | 180.0 |
| 2 Fed. corporate taxes | 5.4 | 8.6 | 11.4 | 4.4 | 7.6 | 10.2 | 4.9 | 6.9 | 10.5 | 5.8 | 7.5 | 8.9 |
| 3 Fed. excise & customs taxes | 5.7 | 6.1 | 6.3 | 4.8 | 5.4 | 5.8 | 4.2 | 4.8 | 5.2 | 4.0 | 4.5 | 4.8 |
| 4 State & local business taxes | 7.4 | 7.9 | 8.3 | 7.4 | 7.9 | 8.3 | 7.4 | 7.9 | 8.3 | 7.4 | 7.9 | 8.3 |
| 5 Business reserves | 10.4 | 10.8 | 11.2 | 9.6 | 10.0 | 10.4 | 9.6 | 10.0 | 10.4 | 9.2 | 9.6 | 10.0 |
| 6 Net national income (1 – 2 – 3 – 4 – 5) | 111.1 | 126.6 | 142.8 | 113.8 | 129.1 | 145.3 | 113.9 | 130.4 | 145.6 | 113.6 | 130.5 | 148.0 |
| 7 Fed. transfer payments | 15.1 | 12.3 | 9.7 | 14.9 | 12.0 | 9.0 | 14.1 | 10.9 | 7.7 | 12.9 | 9.7 | 6.4 |
| 8 State & local transfer payments | 1.1 | 1.0 | .9 | 1.1 | 1.0 | .9 | 1.1 | 1.0 | .9 | 1.1 | 1.0 | .9 |
| 9 Corporate undivided profits | 2.0 | 2.8 | 4.0 | 3.6 | 4.5 | 5.0 | 3.9 | 4.9 | 5.4 | 4.0 | 5.1 | 5.5 |
| Contributions to: | | | | | | | | | | | | |
| 10 Fed. social insurance funds | 2.6 | 2.9 | 3.2 | 2.5 | 2.8 | 3.2 | 2.3 | 2.6 | 2.9 | 2.1 | 2.4 | 2.8 |
| 11 State & local insurance funds | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 | .4 |
| 12 Income payments to individuals (6 + 7 + 8 – 9 – 10 – 11) | 122.3 | 133.8 | 145.8 | 123.3 | 134.4 | 146.6 | 132.5 | 134.4 | 145.5 | 121.1 | 133.3 | 146.6 |
| 13 Fed. personal taxes & nontax payments | 12.1 | 14.3 | 16.5 | 10.7 | 12.7 | 15.2 | 11.4 | 13.6 | 15.4 | 9.6 | 12.1 | 14.0 |
| 14 State & local personal taxes & nontax payments | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 2.0 | 1.9 | 1.9 | 2.0 |
| 15 Disposable income (12 – 13 – 14) | 108.3 | 117.6 | 127.3 | 110.7 | 119.8 | 129.4 | 109.2 | 118.9 | 128.1 | 109.6 | 119.3 | 130.6 |
| 16 Profits before taxes | 10.5 | 15.0 | 19.6 | 11.9 | 16.5 | 21.1 | 12.8 | 17.4 | 22.0 | 14.0 | 18.5 | 23.0 |

Assumption: Relatively optimistic capital formation, revised tax legislation.

Col. 1, 4, 7, and 10, on the assumption that GNP = \$140 billion; col. 2, 5, 8, and 11, that GNP = \$160 billion; col. 3, 6, 9, and 12, that GNP = \$180 billion.

was assumed that part of the deficiency was caused by a shortage of labor and facilities, which cannot be made up immediately; that the deficiency will be made up by the fourth quarter of 1946; and that expenditures will be $0.5 billion above the function in the second quarter of 1947.

In the more favorable pattern it was assumed that expenditures for nondurable goods would be $2 billion above the function throughout the period because of deferred demand and accumulated savings. In the less favorable pattern it was assumed that, because of increased maintenance of expenditures out of savings when unemployment is greater, consumers' expenditures on nondurable goods would be $2.5 billion above the function for the last quarter of 1946 and the first half of 1947.

Through the first half of 1947, consumers' expenditures on durable goods were assumed to be limited largely by supply, although for many individual items demand will limit the sales. Throughout the period the entire group was treated as autonomous. During the first half of 1946 the expenditures for consumer durables as a whole are below the normal relation. Expenditures rise above the normal relation in the third quarter of 1946 and are $3 billion above it by the second quarter of 1947 in the more favorable model and $1 billion above it in the less favorable model. The estimate of consumers' expenditures on durable goods in the favorable model is consistent with sales to consumers at an annual rate of 4.5 million automobiles in the third quarter of 1946 and of 6 million automobiles in 1947.

### 3 Governmental Expenditures

Governmental expenditures for goods and services, estimated by members of the Bureau of the Budget staff, include only the normal expenditures for public works, and do not allow for emergency public works, which would presumably be undertaken to meet serious unemployment.[5]

### 4 Private Gross Capital Formation

The bases for estimating private gross capital formation are even less firm than those for the other sectors of the economy.

[5] In case of serious unemployment, some types of public construction could be undertaken — in general construction other than building — that would not compete for scarce materials.

Consequently, the differences of opinion on the probable magnitude of the expenditures are greatest here. In the more favorable model for each category an estimate of expenditures at or close to the largest that seemed defensible at the time was used.

A high degree of business confidence was assumed and a willingness on the part of business men to use their accumulated reserves for large new investment expenditures on plant and equipment. In the less favorable model it was assumed that the high level of unemployment in the first half of 1946 would have a dampening effect on new investment, that the construction industry would not be able to organize for as much residential and nonresidential building as was assumed in the more favorable model, and that as business activity fell off, inventory accumulation would be less.

The estimate of total private construction was based upon forecasts of construction activity made by analysts of the Department of Commerce and of the Bureau of Labor Statistics. Both forecasts assumed that the sole bar to construction expenditures would be the ability of the construction industry to reorganize and expand its output rapidly.

The demand for business plant and equipment cannot be judged without evaluating business needs at the war's end. 'Plant and equipment' includes all private construction other than housing and all equipment used in business. Many persons think of manufacturers as the chief purchasers of plant and equipment, but before World War II only one-fourth of all investment in plant and equipment was made by manufacturing industries; three-fourths were by wholesalers and retailers, service trades, railroads, public utilities, farmers, etc.

During the war billions of dollars were expended for plant and equipment in war industries, but such expenditures by other industries were severely limited by the controls of the War Production Board. Analysts disagree concerning the extent of the deficiencies that have developed. No conclusive evidence from which to form a final quantitative judgment was available, but existing information justified the belief that demand for plant and equipment during the transition years will be substantially above prewar levels. The following analyses and surveys pointed in this direction.

A Department of Commerce analysis of purchases of plant and equipment before and during the war indicates that in some manufacturing industries, and in many other fields, construction during the war was much less than in the several prewar years.[6] This is true of food products; textiles; apparel; leather products; pulp, paper, and printing; stone, clay, and glass; and lumber products, which accounted for 44 percent of all manufacturing construction before the war. It is true also of commercial construction and of miscellaneous private community facilities. The value of wartime farm construction just equaled that before the war.

The analysis indicates also that during the war purchases of business vehicles (automobiles, trucks, and buses), of many types of manufacturing machinery, and of miscellaneous subsidiary machinery and equipment were much smaller than before the war.[7] Since the industries whose purchases were curtailed during the war will have a postwar business far greater than in 1940, an unusual demand for plant and equipment seems certain.

Scattered evidence indicates that farmers will be in the market for plant and equipment in amounts considerably exceeding their prewar purchases, unless farm income is seriously depressed.

A survey of the investment plans of railroads for 'the year following VE Day' indicated plans for investment of $800 million, twice the average for 1937–40.[8]

Before VE Day the Department of Commerce requested a sample of manufacturers to report the amount of new plant and equipment they expected to purchase during the year following victory in Europe and their expected sales. Sales expectations were well below the present level, in fact, they were those to be expected at a level of gross national product of only $150 billion, 25 percent below the 1944 level. Nevertheless, manufacturers

[6] D. Stevens Wilson, 'Wartime Construction and Plant Expansion', *Survey of Current Business*, Oct. 1944. The periods compared are January 1937–June 1940 and July 1940–December 1943.

[7] Manufacturing machinery and 'other machinery and equipment' are not separated in the published data. The statement in the text is based upon unpublished estimates.

[8] D. Stevens Wilson, 'Planned Capital Outlays and Financing', *Survey of Current Business*, July 1945. A parallel survey indicated investment by electric and gas utilities only slightly above the average during 1937–40.

expected to invest $4.5 billion in plant and equipment, 2.5 times the dollar value of their average annual investment in 1929–40. In all probability, manufacturers did not indicate the entire amount of investment they planned in preparation for postwar business, for some must have intended to postpone investment until materials should be readily available. If, as is probable, manufacturers find their sales during early postwar years exceeding their expectations at the time of the survey, they will tend to increase investment.

From these bits of evidence an estimate of total investment in plant and equipment during the transition years was built. It was thought that the expectations of manufacturers might be roughly typical of those for the entire economic system, since, like the economy as a whole, manufacturing contains both industries that accumulated a surplus of plant and equipment during the war and industries that were unable to make deficiencies good. Total investment in plant and equipment in 1929 and also in 1937–40 was about four times that in manufacturing. Since manufacturers plan to invest $4.5 billion, the 4 to 1 ratio suggested that total investment may reach $18 billion. If plans of manufacturers expressed in the survey understate the total they will actually make in preparation for postwar business, and if other investment is proportionately high, the total will be well above $18 billion. Not all will occur in any one year, however, and several billion dollars of needs may be satisfied by the purchase of war surpluses. After allowance for these factors, $15 or $16 billion seemed not an unduly optimistic estimate of total investment in newly produced plant and equipment in the first postwar year during which materials are freely available. Rough guesses concerning the investment by nonmanufacturing industries in which investment has been restricted during the war yielded a range of estimates whose upper limit is consistent with this total.

The rate of net inventory accumulation was based upon estimates of inventory deficiencies at the war's end and the extent to which a high level of final purchases and continuing shortages would retard the return of the prewar relations between trade inventories and sales. Department of Commerce technicians estimated inventory deficiencies at the end of 1944 on the basis of the relations of (a) manufacturers' value of in-

ventories to gross national product, (b) retailers' and wholesalers' inventories to the disposable income of individuals.

Extrapolations based on these relations indicated an inventory deficiency at the end of 1944 of about $11 billion — $8 billion in manufacturing and about $3 billion in trade inventories — without allowance, on the one hand, for war goods inventories in the hands of manufacturers that will not be usable, and on the other, for surplus materials in the possession of procurement agencies which may be purchased by business enterprises. The Department of Commerce had estimated book value of war inventories in manufacturers' hands at the end of the first quarter of 1945 to be $9.7 billion, $6.7 billion in durable goods industries, $3.0 billion in nondurable.

| | DURABLE GOODS INDUSTRIES | NONDURABLE GOODS INDUSTRIES |
|---|---|---|
| | ($ billion) | |
| Raw materials and goods in process | 5.3 | 2.0 |
| Finished goods | 1.4 | 1.0 |
| Total | 6.7 | 3.0 |

The Department of Commerce had also estimated that procurement agencies had on hand in the United States inventories suitable for civilian use with a cost value of $10 billion.

The estimate of net exports was based largely upon judgment concerning the funds likely to be available to finance foreign demands for American goods for relief and rehabilitation. Since these funds will certainly be government loans, the estimate is the same in both models.

## 5 Gross National Product

Having estimated the autonomous expenditures for each quarter year, it is easy to compute the gross national product and the induced expenditures for the same period, using the equations derived as described in Section 2. For example, in our favorable model for the first quarter of 1946 gross national product is $161.8 billion.

| COMPONENT | $ BILLION |
|---|---|
| Government expenditures | 49.0 |
| Private capital formation | 13.3 |
| Consumers' expenditures on durable goods | 10.5 |
| Rent | 6.0 |
| Consumer expenditures on nondurable goods & services (excl. rent) | 36.9 + .294 GNP |
| Variation from normal | −1.5 |
| Gross National Product | 114.2 + .294 GNP = $161.8 billion |
| Consumer expenditures on | |
| Nondurable goods | 23.9 + .2 GNP + 2 = $58.2 billion |
| Services (excl. rent) | 13.1 + .094 GNP − 3.5 = $24.8 billion |

The projections are in first-half-of-1945 prices. In making the estimates for the autonomous items, it was assumed that the prices would be the same as in the first half of 1945, or, in the case of commodities not made in the first half of 1945, at prices which when introduced into the appropriate price indexes would leave them at the first-half-of-1945 level. Essentially this amounts to the assumption that demand for products whose prices are expected to change is inelastic. Actually, changes in price relations would affect not merely demand for individual products, but total demand as well. For example, if the prices of construction and of durable goods advanced moderately, real demand for them in 1946 would probably be reduced little if any, and at the level of unemployment estimated in the projections the increase in income originating in the construction and durable goods industries would probably swell purchases and employment elsewhere. However, in the absence of any real basis for estimating price changes in the transition period, the effect of relative price changes was ignored in this first forecast.

### 6 Employment and Labor Force

To estimate employment from output estimates involves judgment concerning the length of the workweek and the level of productivity. Output per manhour during the reconversion period will be subject to many conflicting influences, some tending to increase, others to decrease it. Shortening the workweek, which will reduce fatigue, the withdrawal from the labor force of some less efficient workers, and the return to the civilian labor force of the physically most vigorous segment of the population will all tend to increase productivity. The replacement of worn and obsolete machinery and the introduction of improved techniques will bring even greater increases. On the other hand, the addition of workers in many undermanned trade and service industries will increase employment without increasing output. Temporarily, transitional shifts in personnel and changes in methods and products will lower output per manhour. And the decline in munitions output will reduce total national output with a less than corresponding reduction in manhours of employment, since the value of output per manhour in the munitions industries (as in the peacetime durable goods industries) has undoubtedly been somewhat higher than in the economy as a whole.

Balancing these considerations, it was estimated that absorption of a million workers in agriculture and in making good undermanning in several nonagricultural industries would result in a 2 percent decline in output per manhour, and that output per manhour would fall an additional 4 percent due to the reduction in munitions output and to disturbances associated with the transition to peacetime production and a peacetime labor force. The combined effect of these factors is to reduce civilian output per manhour 6 percent from the first half of 1945 to the third quarter of 1946.

Weekly hours of work in nonagricultural private employment were assumed to fall 10 percent from the first half of 1945 to the fourth quarter of 1946, or from 44.6 to 40 hours per week.

A quarterly index of output per worker, constructed on the basis of these judgments, was applied to the estimate of output per worker in the first half of 1945, obtained by dividing gross national product, minus wage payments to the armed forces and interest on the public debt, by the estimated civilian employment. The resulting estimate of output per worker for each quarter was divided into the adjusted gross national product for the same quarter to give estimated civilian employment.

The number of persons in the armed forces was estimated on the basis of demobilization schedules submitted by the military departments.

The estimated change in the labor force was based on judgment concerning the speed with which the wartime extras would leave the labor market. Unemployment is then a residual figure, though in estimating the speed with which wartime 'extra' workers will leave the labor force, the level of unemployment was taken into account.

## *COMMENT*

W. S. WOYTINSKY

### I

Mr. Colm's definition of 'full employment' as a situation in which there are at least as many unfilled work vacancies as applicants for jobs is not satisfactory.[1] According to this definition,

[1] For Mr. Colm's definition, presented originally in discussion, see his reply below.

employment is 'full' if there are 10 million workers out of work and as many unfilled vacancies; it is not 'full' if there are 2.5 million unemployed and 250,000 vacancies. The concept of 'full employment' is, in this way, divorced from the usual connotation of 'good' employment. Fullness of employment is measured not by the size of unemployment or its relation to the labor force, but by the ratio of unemployment to job vacancies. However, in a country as large and heterogeneous as the United States there may be, simultaneously, many workers out of work and many vacancies; for example, mass unemployment among factory workers and shortage of labor in agriculture and forestry; or mass unemployment in the South and shortage of labor in the West. It is not clear why such a maladjustment between the demand for labor and the supply of labor force should be described as 'full employment'.

The postulate of a balance between applications for jobs and unfilled vacancies rests obviously on the assumption that the higher the ratio between applications and vacancies the easier it is for an unemployed worker to find work. From this point of view, the situation should look gloomy when there are 250,000 vacancies for 2.5 million applicants, and highly satisfactory if there are 10 million persons out of work and 10 million vacancies. However, a closer analysis of the turnover of employment and unemployment shows that the number of 'unfilled vacancies' — whatever this term may mean — has little to do with the opportunity an unemployed worker has of finding work. What counts is the number of accessions, i.e., actual hirings per unit of time, say per week. If there were U workers out of work at the beginning of the week and the number of separations and accessions during the week are designated by $s$ and $a$ respectively, the chance an unemployed worker has of finding a job during that week may be measured roughly as $h = \frac{a}{U + s}$. The number of unfilled vacancies does not appear in this formula.

'Full' employment should be used synonymously with 'good', 'high', or 'satisfactory' employment. All these terms express simply our appraisal of the situation. As a guide for appraisal, a maximum of tolerable frictional unemployment may be established and combined with a measure of the velocity of turnover

of unemployment or a frequency distribution of jobless workers by duration of idleness.

Moreover, for the purpose of studies of the Nation's Budget, another definition of 'full' employment may be preferable. We may start from the widely recognized fact that both a depression and a boom cause the labor force to expand. In the event of a deep depression and mass unemployment, members of families in which the main breadwinner is idle begin to look for jobs, and even if they find no work they join the labor force as unemployed additional workers. In the event of a boom — as during the war — additional workers are recruited among boys and girls who, under normal conditions, would have been in school; married women; persons who had retired from the active labor force because of superannuation; and the like. Additional workers are not the same in the two cases but the effect of their influx into the labor market is similar: the labor force increases with declining employment during a depression as well as with rising employment during a boom. In mathematical terms the active labor force is a U-shaped function of the demand for labor.

According to this theory, there must be a state of employment when the labor force is at a low point; that is, when additional workers are fewer than they would have been at a higher or lower level of employment. Characteristic of this employment level is the largest school attendance, the largest number of married women who can afford to give all their time to homemaking, the largest number of retired workers. This level may be described as *normal full employment*, and is defined by the postulate: under full employment the active labor force is at a minimum.

From this point of view, the number of unfilled vacancies is irrelevant. On the other hand, it is not unlikely that the labor force will be at a low point when unemployment reaches a certain level, neither too high nor too low. It remains to future research to determine whether this level is 2 million, 2.5 million, or higher.

The question is of paramount significance in planning for full employment. The goal is not to *maximize* jobs but to determine their number in such a way as to *minimize* the active labor force.

## II

The merits and shortcomings of the Nation's Budget method exemplified by Mr. Hagen's paper should be appraised in the light of experience.

The aim is to estimate future unemployment; computations of single items of gross national product are merely steps preliminary to arriving at the unemployment figures shown at the bottom of Tables 2 and 3. To appraise the method it is enough to compare the figures in these tables for the fourth quarter of 1945 with the actual level of unemployment as revealed by the Bureau of the Census monthly surveys. Hagen predicts for October–December 1945 unemployment averaging 6.3 million under both favorable and unfavorable conditions. The Bureau of the Census recorded 1,520,000 persons out of work in October and there is no indication that the tide was rising in November or December. Consequently, the actual level of unemployment in the fourth quarter of 1945 was probably close to 1.5 million. For the first quarter of 1946 Hagen predicted unemployment of 8.1 million in both the 'more' and 'less' favorable projections. What the Census will show remains to be seen, but many observers think that labor market conditions in 1946 will be about the same as in 1945. Even with an allowance for understatement in the Census figures, Hagen's forecasts seem to be 200 to 300 percent off the beam. Indeed, they suggest mass unemployment at a time when there is an acute shortage of labor, depression when there is a boom, deflationary contraction when the entire economic system is dominated by inflationary forces. In brief, the prediction appears wrong on all counts and useless for any practical purpose.

Moreover, if this is the degree of accuracy of the method for the next quarter or two, its range of error for the more remote future must be still larger. The complete failure of the forecast at the first real test makes pointless further discussion of the applicability of the Nation's Budget method to estimates of future unemployment. Only the causes of this fiasco remain to be investigated.

I think that the errors in the projections have two sources. First, Mr. Hagen, like other partisans of the Nation's Budget method, began his computation with a definite conception of

our economic perspectives. He knew — or believed he knew — that the nation was heading toward a deep depression and mass unemployment; regression lines, as they always do, confirmed his apprehension.

The second source of error is in the method itself. Future unemployment is calculated as the difference between labor force and employment. A moderate margin of error — say of $\pm 3$ percent — in the estimate of the labor force means that the future supply of labor might be estimated with a probable error of $\pm 2$ million. The margin of error in the estimate of future employment is probably much wider. For gross national product the margin of error is hardly less than $\pm 5$ percent, and an equal or larger margin should be allowed for the projection of productivity of labor and weekly hours of work. The cumulative margin of error in the estimate of employment is therefore not less than $\pm 10$ percent, or $\pm 6$ million jobs.

Since the errors in the estimate of the labor force and those in the estimate of employment are not necessarily compensatory, the total margin of error in the forecast of unemployment by the Nation's Budget method may be as large as $\pm 8$ million. In short, a fairly narrow margin of error in the preliminary operations means that the final forecast may be 500 or 700 percent out of the way.

Hagen's errors are within this comfortable margin: in fact, his estimates were 250 percent, or 4.5 million, too high for the fourth quarter of 1945; they will probably be 400 percent, or 6.1 million, too high in the first quarter of 1946; and even the prediction of 9.3 million unemployed in spring 1947 may not be more than 8 million too high.

The method is so inadequate that the most fantastic mistake comes within its legitimate margin of error. .

Much better projections of unemployment might be obtained by direct analysis of future economic conditions, emphasizing qualitative characteristics of prevailing trends. Such projections developed more than two years ago indicated that because of deferred demand for consumer goods, piled up purchasing power, postponed investments, and huge business reserves, there would be sellers' markets in the United States during the reconversion and for a considerable period after. This general appraisal of the economic scene implied that manufacturers

would have a good chance of selling, with a reasonable profit, as much merchandise as they could deliver. It was fairly certain that as long as merchandise was generally short production would tend to expand, and despite reductions in government expenditures, the situation would be inflationary. Long before the end of the war a direct analysis of economic conditions showed that the labor force set free by the cancellation of war contracts and demobilization of the armed forces would be readily absorbed and there would be no mass unemployment either during the reconversion or in the early phase of the post-war economy.

This conclusion is confirmed by historical experience: after each major war, the labor force has been the main bottleneck of reconversion and economic expansion. In the next year or two, temporary unemployment may be large in certain strategic areas and frictional unemployment appreciable in the rest of the nation, but expectations of mass unemployment like that during periods of economic stagnation are utterly unrealistic. Only runaway inflation, social turmoil, or the imminent threat of a new war could reverse the situation and push unemployment up. In that event, however, unemployment would be high for reasons that have nothing to do with the factors taken into account by the Nation's Budget method.

If experience is of any use in appraising projection methods, this is the record: economists who used direct economic analysis for their projections were able to foresee, several years ahead, the actual pattern of employment and unemployment in the transition period; those who used the Nation's Budget method, on the other hand, were responsible for a series of predictions that turned out to be wrong and misleading.

### L. R. Nienstaedt

Mr. Woytinsky's remarks about the general approach of the papers presented by Messrs. Colm and Hagen seemed to me very much to the point. When going from detail to detail it is difficult to see one's direction, and as Mr. Woytinsky suggests, it is the direction that is important. In a forest one sees only the trees; to see the forest the first thing to do is to get out of it. As far as the economic system is concerned, that to me means

to attempt an orientation of the 'system' in relation to something that is 'not system'. This requires first of all a clear definition of what belongs to the system and what does not. Such a definition must evidently establish delimitations outside of which there is no economic activity. In *space* the delimitation is a geographical border. In *economic functions* the delimitation is the place where and the moment when some physical substance resting in nature begins to move into the system for some economic reason. If there is to be no economic activity outside the limits set, trading (movement of economic values) across geographical borders is excluded from consideration; in other words, the system is self-contained and can maintain itself only by production and trade inside its own geographical boundaries. Its relations with the outside consist in the utilization of raw materials from nature for productive purposes and the return of these same materials to nature when the useful objects they were part of are discarded. From such a point of view the economic process is a circular process resembling the metabolism of a living organism, and the system as defined is self-contained only in the sense that it is unrelated to any other economic system.

It is not unrelated, however, to something that is not system — natural resources, for instance. And a little consideration and observation will demonstrate that although the system is an economic system it must be under a definite influence of factors from the outside that are not 'economic' in the usual sense — length of the harvest period, length of day and night, etc. Further consideration may prove that relations between some factors inside the system may eventually be determined by these outside factors. These relations may be truly causal and very stable because the outside factors persist and are not influenced by any reactions from the inside factors. They are given facts to which the system must adapt itself even in an economic sense. This adaptation may determine trends that override all short term phenomena, i.e., determine the direction the system is moving in.

This approach, which allows a clear distinction between truly primary factors outside the system, or inherent in it, and induced factors, both spontaneous and conscious, inside the system, has been developed in my book, *Economic Equilibrium*,

*Employment and Natural Resources* (Principia Press, Bloomington, Ind., 1942).

As regards the full employment bill, I fear the term 'full employment' as now used is much too ambiguous. Sixty million jobs is the goal. But what is a job? It is so and so many hours of work for one year by an individual paid at such and such a price. Since, in a modern economy, everyone's work and income depends upon everyone else's work and income, full employment becomes a primary concern of 'general welfare'. On the other hand, respect for the freedom of the individual must admit the right to refuse the job offered (or 'guaranteed'). Clearly here is a dilemma of far-reaching consequences. As long as the right is exercised by only a few individuals at a time, there is no threat to the general welfare. However, if large segments of the population all at once exercise their right because they do not want to accept the jobs offered or 'guaranteed' all guarantees become absurd. At one extreme of the dilemma the right of refusal annihilates the possibility of a job for every citizen, while at the other extreme the right to a job for every citizen annihilates the right to strike and the fundamental freedom of the individual. There was no right to strike in Germany but everyone was supposed to have a job.

How can this contradiction be solved? What exactly is it possible to guarantee? Since it will be the economists who have to answer these questions, they are the first to be concerned. In view of the fundamental nature of the dilemma, it seems to me that it would clarify matters considerably if a concept of employment could be introduced that implies a freedom of choice between clearly defined consequences. At the same time such a concept must allow exact quantitative definition and be susceptible to mathematical manipulation in order exactly to determine what it is possible to guarantee under such and such conditions. I believe these requirements are met by what I would call 'the average chance of finding employment' meaning by 'employment' a definite number of manhours (a full time equivalent) any individual in a population of such and such a size could expect to be employed during a year if he accepted such and such an average wage rate, etc. For example, if a full time equivalent is 2,000 hours, an average chance of finding employment of 1 in 5 means that 20,000,000 in a population of

100,000,000 may work 2,000 hours annually on an average at such and such an income, or that 40,000,000 may work 1,000 hours at half that income.

Can such a term be defined? And can its dependence on other primary factors be established in a truly one-way causal fashion? I think so; at least as far as physical production is concerned. This was attempted in my book where it is shown, for instance, that the average chance of finding employment (3,510 manhours per annum) in physical production in the American economy declined from 1 in 5 to 1 in 8 between 1901 and 1929. This result is deduced independently from observation of interrelations between primary factors, then verified by statistical criteria. So far nothing has been done on the chances of employment in trade and services.

CLARK WARBURTON

The methodology currently used by econometric model-builders for estimating the future size of gross national product is essentially that of comparing the size of the parts of a whole with the size of the whole. The logic seems to be:

The whole is made up of its parts — in the case under discussion, three principal parts;

Certain relations have been found by experience between the size of the whole and the size of certain parts;

The size of the remaining parts has been found by experience to be related to the size of the whole and to the size of other parts;

Therefore, if we know the size of certain parts we can estimate the size of the whole;

Therefore, the size of the whole causally depends upon the observed relations between certain parts and the whole;

Ergo, by swelling the size of certain parts, corresponding changes are produced in the size of the whole.

This basic methodology has as much applicability to scientific problems in a wide range of fields as to the problem of forecasting the value of national output. One field in which it has been widely applied is that of anthropology, the specific problem being estimation of the size of a body from the length or dimensions of one or a few bones. However, this anthropological

application involves only the first four steps in the foregoing sequence. I wonder what the anthropologists would think of the fifth and sixth steps.

Let me take another analogy. If we measure a large number of plants we will probably find, for each species, typical relations between the lengths of the longest root, the stalk, and the head — the sum of the three being the total length of the plant. As long as these relations hold, if we can find some hormone — I believe such a hormone has in fact been found — to make the roots grow longer, we can expect to have taller plants. But when we turn to the real world and want to know why crops in Oklahoma were not as tall in 1934 and 1935 as in previous years, is this kind of analysis helpful? Rainfall statistics might conceivably be more significant. Or, if we want to guard against recurrence of such a situation, an irrigation project or a rain controlling device (if we have the 'know-how') might be of more practical use than a hormone factory.

The Budget Bureau and Mr. Hagen do not lean as heavily as other economic forecasters on the practice of stimulating growth by means of hormones. From current data they develop forecasts of the major constituents of gross national product by noting the short-run trends in the relative size of roots, stalks, and heads of the plants that have been grown in the fields during the last year or two or are still growing (a method essentially similar to that of the Department of Agriculture in forecasting crops in a given year). They give some attention also to the methods of cultivation and kinds of fertilizer that have been applied to the fields and appraise their probable effects. This methodology, nevertheless, is based upon essentially the same logic as that of the model-builders. The Budget Bureau and the Office of War Mobilization and Reconversion apparently assume that they are faced with the problem of deciding upon the strength of the hormone concentrate that should be applied in order that the crops this year or next will be up to standard. They ignore, however, the possibility that the probable rainfall during the next year and the water table resulting from the rainfall of the past few years may have sufficient relevance to the problem to be given specific consideration.

Also, I would like to point out that, even though we were not sure that we knew how to do so, in 1913 (with some improve-

ments in 1917) we built a rain-controlling device that has proved to be exceedingly effective — so effective indeed that in the early 1930's it gave us and the whole world the greatest economic drought recorded in history and during the last two years has given us greatly excessive moisture. More attention should be devoted to the current operations of this rain-controlling device, which have a great deal of relevance to the problems toward which the analyses of Mr. Hagen and the Bureau of the Budget are directed.

Finally, I would like to make two suggestions regarding research on the variability of consumer and business spending. First, if the mathematically-inclined makers of economic models would combine with the classical general-equilibrium theory of a static economy the equally traditional, respectable, and unrefuted theory of unneutral money, they would have a theory of a dynamic or moving equilibrium that might give them a good exercise in applied mathematics and would provide the theoretical basis for the construction of models with some resemblance to reality.

Second, if the economists who are interested in full employment under a system of private enterprise would look at the cases in the past where relatively full employment has been achieved for a few years and then lost, they might discover the conditions essential for the maintenance of full employment without government deficits. If, for example, they would look carefully at the data for the 1920's and early 1930's, they would find that during the 1920's, when we had a relatively high level of production and a moderately stable price level, the average rate of growth in the money supply was about 5 percent per year, but that this growth was stopped in the early part of 1928 and after two or three years of irregular slight decline was followed by a precipitate contraction. Such facts as these might lead to the conclusion that it was impossible for business and individuals to maintain their expenditures in line with increasing productive capacity without drastic changes in monetary habits, rather than to the conclusion — embraced by the Keynesians but repugnant to common sense — that the depression was ushered in by a change in monetary habits in the form of a sudden and great reluctance of business and individuals to spend the money in their possession. The facts regarding the

stability or erraticism of monetary habits, I suggest, have considerable relevance to the problem of estimating the adequacy of demand for potential postwar output and to the governmental policies that are necessary and desirable for full employment in an economy of free consumer choice and private enterprise.

MORRIS A. COPELAND

Mr. Colm concludes that our present economic understanding and statistical proficiency enable us to forecast business conditions with sufficient accuracy to implement the Murray Bill. While he does not make this clear, it would seem that his conclusion is meant to apply to forecasts of business conditions for a year and a half ahead. Thus Hagen's forecast extends forward for seven quarters from August 1945.

Two questions not really discussed by Mr. Colm or Mr. Hagen would seem pertinent to such a conclusion: What economic expedients to maintain full employment does the Murray Bill contemplate and what types of forecast does each call for? Among these various types of forecast, which are we able to do most effectively today?

It is suggested that the expedients contemplated by the Murray Bill call for the following types of forecast, among others:

(1) At how much, if any, below a full employment level is our economy likely to be operating during the next eighteen months unless specific new measures to raise the level are taken? (This type of forecast is presumably called for annually.)

(2) Is there any likelihood that with the types of private pecuniary motivation now in force and in the absence of a large public expenditure program we will be able to achieve and maintain approximately full employment during any, say, four successive years after about 1950? (A single-time official plus-or-minus forecast of this sort might implement the private-sphere provisions of the Murray Bill. However, any major actual or prospective change in the structure of private pecuniary motivation would be an appropriate occasion for a revised forecast.)

(3) Assuming that a 'shelf' of expenditure programs is to be accumulated, what are the dimensions of the prospective deficit

in the national production and expenditure budget it should be designed to meet?[1] That is, how sharp, how deep, and how prolonged a depression should we be prepared for? Such a forecast is needed in answering questions such as how large should the shelf be? How large a volume of expenditure programs could be put into operation in how short a time and how nearly ready-to-go should projects be before admitting them to the shelf? What should be the composition of the shelf and the type of arrangements for activating included projects? (While such a forecast would need revision from time to time, it is not clear that annual revision is called for.)

(4) Are business prospects for the next nine months such as to make checks on further expansion or business stimulants advisable? (This plus-or-minus type of forecast is presumably needed on a quarterly or more frequent basis and separately for each of several major segments of business.)

We may apply our second question first — which of these four types of forecast are we able to do most effectively today? Type (2) is the easiest forecast in its absolute form. Model analysis is clearly pertinent broadly to this type of forecast, but this plus-and-minus variety of forecast in its absolute form might equally be made on the simple basis that depressions are likely to recur unless we take steps to prevent them. However, when it comes to forecasting whether some proposed structural change will eliminate depressions, the difficulty of forecast is increased; if the proposed change is a major one, very greatly increased.

Type (3) is certainly a forecast we can do today. Although quantitative, it calls only for fixing limits on the various dimensions of the prospective deficit against which a shelf is to be accumulated: a safe minimum annual rate of shelf-project expenditure to provide for; a safe minimum period for which to provide this rate; and a safe minimum time in which to achieve

[1] By a 'shelf' is here meant a file of lawful projects, public and private, such that (a) the activation of each can, within limits known to a central authority, be materially delayed until the go-ahead signal is given or be materially advanced, and (b) each can be counted upon to get into actual production according to a schedule beginning after a certain interval subsequent to notice of activation. The shorter the interval the shorter the forecast of Type 4 needed for drawing upon the file. If the interval is to be known by the activating authority, an advance commitment of funds will probably be necessary.

this rate. The chief problem is how to compromise between limits generous enough to be statistically fairly safe and limits modest enough so that it will be politically expedient and administratively feasible to achieve the shelf.

Type (4) is not properly a simple plus-or-minus forecast, as the term 'steering-wheel policy' suggests; checks may be needed in some directions and stimulants in others at the same time so that several plus-or-minus forecasts are needed for each quarter. Nonetheless, it is much easier than Type (1); partly because it is a plus-or-minus forecast for each significant direction. But the fact that nine months instead of eighteen will suffice for most purposes is also important. Colm has drawn a distinction between 'primary' and 'induced' components in a *GNP* projection. It seems clear that the primary components would ordinarily constitute a larger proportion of the total *GNP* for a nine month than for an eighteen month projection. Some components that should be regarded as 'induced' for purposes of a longer-term forecast should be regarded as 'primary' for purposes of a shorter-term forecast. Hagen does not seem to have taken full advantage of this fact, perhaps because the problem of doing so was complicated by the special conditions of the transition period. It seems fair to say that in general we are far better able today to do a Type (4) than a Type (1) forecast. Usually an accurate and useful Type (4) forecast is easy. The real difficulty comes in 'calling the turns'. And if the turns cannot always be called nine months in advance, to call one three or four months in advance is far better than to wait until the turn has taken place.

Now as to our first question: for what economic expedients is each type of forecast useful? Type (2) is essential in connection with the adoption of any proposed structural change to promote full employment. It is essential also in connection with the adoption of any flexible policy, whether flexible tax rates, flexible credit policy, flexible expenditures, or what-have-you. Type (4) is essential in connection with the proper operation of any flexible policy, and Type (3) in connection with the proper operation of a flexible expenditure program. Type (1) is intriguing from the viewpoint of economic theory, and in conjunction with other features of the Murray Bill has certain political advantages. But its appropriateness to any specific

economic expedient is by no means clear. The most difficult and least needed type of forecast seems to have received an undue share of attention.

As a corollary of the above considerations it may be urged that it is advisable both to adapt our efforts at forecasting to the requirements of a full employment program and to adapt our full employment program to what is known regarding our present capacities for various types of forecasting.

MORDECAI EZEKIEL

Mr. Colm's statement concerning the lack of basis for economic forecasting was apparently directed at efforts to forecast the general business situation as a whole. As is well known, past efforts at general business forecasting — such as those made by the Harvard Economic Service for many years — have had 'batting averages' of about 50 percent; that is, the forecasts were little, if any, better than would have been obtained by tossing a coin.

Other types of economic forecasting, such as forecasting developments, commodity by commodity, in the agricultural field, have given better hope for success. They are based upon the large number of agricultural economic studies of factors determining price, supply, and demand for individual commodities, that have been made since 1915. For more than twenty years the Department of Agriculture has been publishing an annual 'Agricultural Outlook Report' in which forecasts are given of the prospects for individual agricultural commodities a year or two ahead — forecasts covering prospective shifts in production, consumption, demand, and prices. As far as they indicate the general future direction, up or down, their 'batting average' has been 80–90 percent right.[1]

The success of this commodity-by-commodity forecasting service has made it valuable as an economic service to farmers on which to base their future production programs. In turn, this realistic and proved knowledge of how the economic factors work in various agricultural industries made it possible to carry through the various operations under the Agricultural Adjust-

[1] Oris V. Wells, 'A Comparison of Outlook Statements with Subsequent Events' (U. S. Department of Agriculture, Bureau of Agricultural Economics, mimeographed, Jan. 24, 1930).

ment Act and subsequent agricultural control legislation in the light of what the controlling economic elements really were.

Although, as indicated, it is more difficult to forecast the general business situation as a whole, many factors of the Nation's Budget could be forecast by a similar industry-by-industry analysis. Output of housing and construction, automobiles, and many other capital goods are determined in part by inherent cycles or other characteristics of the industries themselves. Their production and sales, therefore, are not entirely dependent upon the levels of national income as a whole. To the extent that these individual items in the national budget can be forecast from their own internal industry situations, the accuracy of the national forecast can be increased, and the projections of the Nation's Budget given somewhat the same degree of reliability that the projections of agricultural situations have had in the past.

## *REPLY*

### MR. COLM

*The Concept of Full Employment.* The concept of 'full employment' has been challenged. In response to a question from the floor I defined 'full employment opportunities' as a condition in which the number of vacancies equals the number of job seekers. Mr. Woytinsky objects to that definition. He says we may have millions of job seekers and millions of vacancies, but that would still not be 'full' or 'good' employment if job vacancies and job seekers do not fit each other because they are in different regions or of different types.

Woytinsky proposes to measure the status of employment by measuring the chances of an unemployed worker to find a job, and presents a formula: $h = \frac{a}{U + s}$; $a$ and $s$ designate the number of accessions and separations in a unit of time; $U$, the number of unemployed workers at the beginning of the unit of time. Let us test his formula by some hypothetical figures.

Assume that, in case 1, of a 60 million labor force 10 million are unemployed and 5 million are fired and rehired during the period. The chance of an unemployed worker finding a job is then expressed by Woytinsky's formula as: $h_1 = \frac{5}{10 + 5} = 1{:}3.$

In case 2 the number of unemployed is the same, but we assume a complete turnover within the employed labor force, namely, 50 million accessions and 50 million separations. The formula then gives: $h_2 = \dfrac{50}{10 + 50} = 1{:}1.2$. In case 3 the number of unemployed is only 1 million and the number of accessions and separations is assumed to be the same as in case 1, that is, 5 million each. In this case then: $h_3 = \dfrac{5}{1 + 5} = 1{:}1.2$.

This measurement shows an equal approximation to 'full' or 'good' employment in cases 2 and 3 although the unemployed number 10 million in the one and 1 million in the other. It seems to me that Woytinsky's formula measures the unemployed worker's chance of finding a job but neglects to measure the employed worker's chance of being fired. In this respect I think his approach fails to measure 'full' as well as 'good' employment.

Nienstaedt proposes to measure 'the average chance of finding employment', expressing employment by a certain number of manhours as an equivalent for an individual employed full time. I think in all our estimates we have actually been using manyears in measuring the number of employed and unemployed rather than the number of individuals in or out of a job. Consequently, no one will quarrel with Nienstaedt's proposal in this respect.

Nienstaedt's formula, if I understand it correctly, merely expresses employment, measured in terms of manyears, as a ratio to the population as a whole. I can see its value for depicting a trend, as he does in his book, but I fail to see that his formula can help in solving the problems he raises with respect to the purposes of a full employment policy.

Nienstaedt, however, tends to oversimplify our problem when he assumes that primary physical factors provide a simple causal relation from which we can determine the quantities of employment and unemployment. The problem he struggles with is fundamental to any consideration of the means whereby full employment can be attained. Physical environmental factors are of great importance to our society and should be considered in interpreting the significance of statistics, particularly

of dollar figures. However, if physical factors were the primary and controlling determinants of the level of economic activity, there would be no need for a full employment bill.

Nienstaedt is also worried about another problem. He believes that any government assurance of full employment is incompatible with 'the right to strike and the fundamental freedom of the individual'.

I believe that Woytinsky's as well as Nienstaedt's doubts can be met by distinguishing, as I suggested, between full employment *opportunities* and actual full employment. Full employment opportunity means that there is a job for each person in the labor force. Some persons in the labor force may still not actually get a job because of regional discrepancies, discrepancies in skill and training, differences in wage scales offered and wages demanded, or for other reasons. 'Good' employment, which Woytinsky wishes to measure, should comprehend all factors that affect job opportunities as well as actual employment. For purposes of analysis, and even more important, for purposes of government policies, it is, however, of utmost importance to distinguish between employment opportunities and actual employment. There are opportunities even though some workers must migrate or retrain or settle their conflict with management before the opportunity can materialize.

If I correctly understand the purposes of the 'full employment' bill, it is intended to assure the creation of sufficient job opportunities but is not designed to guarantee actual employment for everybody. Limiting the assurance of the government that full employment opportunities will exist does not mean, however, that the government does not also have the responsibility of helping to overcome the discrepancies between jobs offered and sought and labor-management conflicts. It is, I believe, desirable to develop methods to measure employment opportunities as well as actual employment. There is probably not any one single set of figures that can adequately measure both employment opportunities and actual employment.

*Various Types of Projection.* Copeland emphasizes quite correctly that various types of policy formulation require various types of projection, covering short, intermediate, and long periods. In addition — and this is very significant — he suggests that possible patterns of economic development be

sketched as a basis for preparing programs for actual use when needed.

Copeland's remarks can help to clarify some aspects of the discussion that was initiated by Hagen's presentation of a set of estimates. These estimates, which were prepared immediately after VJ Day, were, I believe, valuable for illustrating methodological problems and for demonstrating possible patterns of economic development in the reconversion and post-reconversion period. The projections showed that in the period of restocking and reequipping, inflationary pressures may prevail although current incomes are expected to decline. These projections suggest the need for preparing policies to deal with this particular type of inflation as well as prepare plans for meeting deflationary tendencies after the end of the restocking and reequipping boom.

The fact that the number of unemployed estimated for the reconversion period proved to be exaggerated should not be minimized and should teach a valuable lesson. I do not believe, however, that the errors in the short run prove that the patterns of economic development indicated for the intermediate and long run periods are necessarily wrong. Woytinsky questions the method presented by Hagen, the patterns of economic development, and the policy conclusions suggested by these projections. He may or may not be right. He believes that "to appraise the method it is enough to compare the figures in these tables for the fourth quarter of 1945 with the actual level of unemployment as revealed by the Bureau of the Census monthly surveys". This, I believe, is not a valid conclusion. The fact that the unemployment estimates of these projections were exaggerated for the first part of the transition period proves very little for the real controversy concerning the method of projections and the probable patterns of development. This experience does prove, however, the validity of Copeland's point that the significance and limitation of each projection with respect to permissible policy conclusions should be emphasized.

## Mr. Hagen

If two football teams meet during the first postwar season, with many changes in their line-ups caused by 'reconversion' of the

college population, and if two individuals bet upon the outcome of the game, one will be more nearly correct than the other, barring a tie. It would be unwise, however, to conclude that this individual possesses a superior procedure for judging the results of all future games between the two teams.

Similarly, Mr. Woytinsky's conclusions concerning the Nation's Budget method of forecasting economic conditions constitute a drastic jump from limited premises. The evidence consists of a non-random sample of one forecast. To draw conclusions concerning a population consisting of all future forecasts — as Mr. Woytinsky does — is unwarranted.

One specific point in Mr. Woytinsky's analysis should be noted before his general criticism is commented on. I do not understand his statement that regression lines necessarily — Mr. Woytinsky says "always" — indicate that the nation is heading toward deep depression and mass unemployment. A given set of regression lines may indicate this. Another may not. Almost any systematic relationship can appropriately be expressed by a regression equation. To deny the validity or relevance of regression equations is substantially to deny that systematic relationships exist between the variables. I think that Mr. Woytinsky would not deny that relationships exist, for instance, between consumer disposable income and consumer expenditures. He has repeatedly used regression lines to relate these variables.[1] Since he therefore obviously does believe in the use of regression equations for purposes relevant to the present discussion, his statement here seems meaningless. It is worth while noting that as it stands it is obviously in error.

Mr. Woytinsky begins his criticism of the logic of the Nation's Budget method by stating that by it "future unemployment is calculated as the difference between labor force and employment" and therefore is subject to wide errors. The statement is correct — but I do not know of any other method of forecasting unemployment.

The margin of error in any forecast of unemployment is due not to the use of a particular method but to the nature of unemployment as a small final residual in a chain of causation.

[1] See, e.g., W. S. Woytinsky, 'Relationship between Consumer Expenditures, Savings, and Disposable Income', *Review of Economic Statistics*, XXVIII, 1, Feb. 1946.

Unemployment arises because job opportunities are less numerous than job seekers. The number of job opportunities depends upon the level of output. Small variations in forecasting the level of output, plus small errors in forecasting the level of employment that will be associated with any given level of output may result in percentage errors in forecasting employment that will be far greater percentage errors in forecasting unemployment. A forecast of unemployment by no matter what method is subject to large percentage error for this reason. Since Mr. Woytinsky himself bases his forecast of unemployment on one of output and therefore implicitly of employment (see the last page of his criticism above), there would seem to be no valid basis for his criticism of this aspect of the Nation's Budget method.

The Nation's Budget method of forecasting is simply a systematic procedure for adjusting estimates of consumer expenditures, government purchases of goods and services, and components of private capital formation, so that they will be mutually consistent. Obviously, the level of government expenditures and revenues and the level of private capital formation are partial determinants of the level of total output and income. Equally obviously, the level of consumer expenditures depends upon the level of total income, though not upon that alone. Again, the levels of various components of private capital formation depend in part upon consumer expenditures. The Nation's Budget method is merely a simple method of making clear the relation between component estimates, so that an explicit basis exists for judging their mutual consistency. Following a procedure that makes this possible is in my judgment an important improvement in forecasting techniques.

However, it remains true that the method determines the levels of output, income, employment, and unemployment which are forecast, only so far as it reveals inconsistencies. The estimates depend in the first instance upon judgments and data that are independent of the method used.

Mr. Woytinsky would reject this systematic procedure for checking inconsistencies, and would substitute a "direct analysis of future economic conditions, emphasizing qualitative characteristics of prevailing trends". I do not understand what he means. He clearly does not propose estimating unemploy-

ment or employment directly, without regard for the level of output. I hardly think that he means that each component of output should be estimated independently of every other component. It therefore seems probable that his statement constitutes merely an expression of the opinion that his *judgment* at VJ Day concerning coming conditions was better than that of persons who were using the Nation's Budget method. Concerning this I have no comment to offer. I would merely note that it is not relevant to the question whether the Nation's Budget *method* is a useful one, and therefore that Mr. Woytinsky's criticism in the main is irrelevant.

PART III

# Problems of International Comparisons of Income and Wealth

MORRIS A. COPELAND
*National Bureau of Economic Research*

JEROME JACOBSON
*State Department*

BERNARD CLYMAN
*University of Delaware*

# National Income Estimates of Latin American Countries

LORETO M. DOMINGUEZ
*Inter American Statistical Institute*

# PROBLEMS OF INTERNATIONAL COMPARISONS OF INCOME AND PRODUCT

MORRIS A. COPELAND
JEROME JACOBSON
AND
BERNARD CLYMAN

AN INTEGRAL PART of the United Nations is a Social and Economic Council, which has among its aims the development of policies directed toward raising standards of living in all countries, and the creation of awareness throughout the world of the economic problems of each country. This Council, aided by many factors, will undoubtedly stimulate international economic research. This means that international comparisons of national income and gross national product will be of much greater importance.

International income comparisons can be helpful in dealing with many matters. For example, they may show the role played by the export-import trades in a nation's total economic activity, they may make possible international comparisons of productivity and living standards, and they may reveal the allocation of economic resources between consumption and capital formation in various countries, the proportion of each nation's resources devoted to producing military goods and services, its capacity to make an international economic contribution, and the response of economic activity in one country to changes in others.

Mere totals of the national income of each country will not throw much light on questions such as these. More detailed analysis of the components of national income and of related factors is essential. Even when formal comparability in respect of definitions has been achieved, a comparison of percentage

figures, e.g., of the proportion of national income devoted to civilian consumption in two countries, may be misleading. And any attempt at absolute comparisons in value terms, using over-all exchange rates for conversion to a common currency unit, is hazardous. When an investigator seeks accurate conversion factors to enable him to state per capita incomes for two countries, e.g., in United States dollars, he encounters numerous difficulties. Illustrations of these propositions are offered below.

The report recently prepared for the Combined Production and Resources Board dealing with the impact of the war on the civilian economies of the United Kingdom, Canada, and the United States is evidence of the extensive cooperation among the economists and statisticians of the three countries who collaborated on it.[1] (Such collaboration is possible only under the auspices of an international body such as the CPRB.)

The report presents physical volume measures comparing prewar and wartime consumption in each country. For various areas of consumption an attempt was made to provide also intercountry comparisons of absolute consumption levels. Further, in order to indicate how and why the war affected consumption levels and patterns, estimates of national income and gross national product and their components were examined. It may be instructive to review the experience encountered in developing these measures.

However, if this experience is to be taken to illustrate the problems involved in international income comparisons, it should be with the understanding that only the problems as they appear under relatively favorable conditions are illustrated. The CPRB report necessarily took as its basis existing

[1] *The Impact of the War on Civilian Consumption in the United Kingdom, the United States and Canada* (Washington, D. C., Government Printing Office, 1945; London, His Majesty's Stationery Office, 1945). A Combined Committee on Nonfood Consumption Levels was established by the CPRB to be responsible for the preparation of this report. The members of the committee were: from the United Kingdom, Harry Campion and R. G. D. Allen; from Canada, J. F. Parkinson and R. W. James; from the United States, Emerson Ross and Morris A. Copeland, Chairman. The names of other collaborators appearing on the title page are: from the United Kingdom, W. B. Reddaway, E. F. Jackson, and Miss P. M. Nye; from Canada, Miss M. L. Reid; from the United States, Charles Merwin, Jerome Jacobson, and Bernard Clyman. In addition, the report acknowledges gratefully the contributions of many agencies in the three countries whose economists and statisticians participated in its preparation.

compilations. But the wealth of statistical data available for the three countries covered by the report contrasts with the poverty of data for many — indeed for most — other countries. Moreover, comparisons were greatly facilitated by the close cultural kinship of the three countries; or rather, the difficulties inherent in cultural differences were minimized.

The accomplishments and shortcomings of the report may be briefly summarized. Among the accomplishments are:

The national incomes (and gross national products) of the three countries, together with broad divisions by both source and use, were presented on an approximately comparable conceptual basis.

These compilations made possible various percentage comparisons, e.g., the percentage of gross national product devoted to war. To illuminate this particular percentage, roughly comparable allocations of employment between war and nonwar were made.

Various components of national income were corrected for price changes, particularly munitions production and several categories of consumption. For the consumption categories intertemporal comparisons were thus made possible, e.g., comparisons of the percentage changes from prewar to wartime levels in the three countries.

For various components of national income crude interspatial comparisons were developed. These made it possible to say, for example, that United Kingdom per capita consumption of tobacco before the war was about 80 percent as large as United States.

On the negative side the following points may be noted:

While a standard set of national income and gross product components was adopted, full detail for all three countries was impossible. For example, saved income estimates were not available for Canada and several consumption categories had to be bracketed to make them comparable with United States and United Kingdom figures. Only for the United States was a refined measure of the percentage of gross product devoted to war given.

Even had perfect conceptual comparability been attained, such ratio computations as that of war product to gross national product would still have involved serious incomparabilities, due

to differences in the price structures of two economies and to the fact that one country imports proportionately more foodstuffs than the other.

Some adjustments for price changes used in the intertemporal comparisons were far less satisfactory than others. In the case of the United States, most, if not all, are in an area of acrimonious controversy.

Interspatial comparisons are notoriously more difficult than intertemporal; accordingly, the results shown for such comparisons are thought to be considerably less dependable. All interspatial comparisons were rounded to the nearest 10 percent and relegated to the Appendix. The list is somewhat shorter than that for intertemporal comparisons.

No attempt was made to present time series for either total national income or gross national product, adjusted for price changes. The chief components not adjusted for price changes were in the area of savings and capital formation. Nor was any attempt made to present a direct interspatial comparison of levels of national income or gross national product. Interspatial comparisons were lacking for a somewhat larger area — including in addition to savings and capital formation most consumer services and a category of miscellaneous consumers' goods.

Canadian compilations, according to the standard pattern adopted, were less complete than those for the other two countries, largely because extensive revisions of Canadian income estimates are not yet finished. Partly for this reason and also to simplify the statements, attention is given chiefly to United Kingdom–United States comparisons in the more detailed consideration of the problems of international income comparisons that follows.

The discussion of intercountry income and product comparisons may conveniently be divided into three main parts: (a) conceptual comparability and comparability of component ratios; (b) comparability of measures of intertemporal change; (c) direct intercountry comparisons.

## 1 Conceptual Comparability and Comparability of Component Ratios

It was hoped that if the totals of income and gross product and their chief components were brought into approximate agree-

ment conceptually, approximately comparable component ratios could be derived.

The starting point for total United States income in current prices was the estimates prepared by the United States Department of Commerce; for the United Kingdom income the basic estimates were those presented in the White Paper on war finance: An Analysis of the Sources of War Finance and Estimates of the National Income and Expenditure in the Years 1938 to 1944, Cmd. 6623. To approximate a uniform definition of national income and gross national product the following adjustments were made:

*Wages and salaries*

Employers' social security contributions were added to United Kingdom figures; the value of food and clothing furnished the armed forces and the government's share of dependency allotments were added to the United States figures.

*Additions to corporate surplus*

Corporate income and profits taxes were regarded as part of this distributive share and were added to the United States figures.

*Income from ownership of property*

This was defined to include imputed rent; therefore, net imputed income derived from owner-occupied residences and tenant-occupied farm residences was added to the United States figures.

*Capital gains*

The United Kingdom figures have the effect of counting the increase in the value of business inventories rather than the value of the increase in inventories. No satisfactory estimate of the value of the increase in inventories was available for the United Kingdom. Consequently, estimated capital gains and losses on inventories were added to the United States figures for additions to corporate surplus and entrepreneurial profits.

*Interest and dividends*

For a while it was hoped to include imputed interest figures, based on estimated tangible government assets, to replace cash interest payments by governments. As it was impossible to do

this in the time available, cash interest payments on the United Kingdom central government debt and the United States federal debt were omitted.

*Personal remittances and institutional contributions*

To approximate an income received basis, net personal remittances and institutional contributions paid abroad were deducted from interest received from abroad in the case of the United States.

*Gross national product*

Gross national product derived from the economy (by source of funds) was taken to be equal to national income received, less income received from abroad, plus 'depreciation, depletion, and capital outlays charged to current expense'.

*Depreciation, etc.*

'Depreciation, depletion, and capital outlays charged to current expense' in the case of the United States includes estimates prepared by the CPRB staff which roughly represent depreciation on government structures.

All the foregoing adjustments were applied to the estimates of national income and gross national product by source of funds. Corresponding changes should be made in estimates by object of expenditure. The effect of the above adjustments may be illustrated by figures for 1943 in Table 1.

The main reason for the large discrepancy between the object of expenditure and source of funds estimates on the United States side is the substitution of William H. Shaw's revised figures on consumers' expenditures for those carried in the gross national product estimates; the substitution of a slightly revised Department of Commerce series on construction for the one carried in the gross national product estimates is also a factor. There are other minor reasons not considered important enough to detail. The absence of a discrepancy in the United Kingdom estimates is due to the method of estimating capital formation — the item is computed as a residual.

The adjustments outlined above were selected because it was understood that they would be approximately those which have been agreed upon by the responsible parties in each country charged with preparing the official estimates. It was expected

TABLE 1

National Income and Gross National Product Adjusted Estimates
United Kingdom and United States, 1943

| | UNITED KINGDOM | | UNITED STATES | |
|---|---|---|---|---|
| | White Paper basis | CPRB report basis | CPRB report basis | Commerce Dept. basis [a] |
| | £ million | | $ billion | |
| Employees' income | 5,349 | 5,421 | 110.9 | 105.2 |
| Additions to corporate surplus | 2,730 | 2,739 | 20.9 | 4.9 |
| Net rents & entrepreneurial profits | | | 29.0 | 27.7 |
| Interest & dividends | | | 7.9 | 10.1 |
| National income | 8,079 | 8,160 | 168.7 | 147.9 |
| *Minus:* | | | | |
| Income received from abroad | ... | ... | .1 | ... |
| *Plus:* | | | | |
| Depreciation, depletion, & capital outlays charged to current expense | 475 | 475 | 12.0 | 9.0 |
| Discrepancy between sources of funds & object of expenditure estimates | .. | ... | 4.8 | 1.2 |
| Other adjustments | ... | ... | ... | 28.4 [b] |
| Gross national product | 8,554 | 8,635 | 185.4 | 186.5 |

[a] *Survey of Current Business*, April 1944. [b] Business taxes and bad debt charges.

that, in view of the Tripartite Discussions described in Part I, revisions somewhat along the above lines would be incorporated in the official statistics.

Various component ratio comparisons were made on the basis of the adjusted global figures. These involved national income and gross national product on an object-of-expenditure rather than a source-of-funds basis. National income was divided three ways on an object basis: income devoted to (1) consumption; (2) war; (3) nonwar capital formation. For this division it was necessary to deduct estimated indirect taxes from the gross expenditure estimates. A special allocation of the United States indirect taxes was prepared by the Commerce Department: (1) by assigning to consumption taxes levied on consumption goods and services and (2) by prorating the remaining indirect taxes on (a) government war procurement and contract construction, (b) government nonwar procurement and contract construction, (c) net private domestic capital formation, (d) net exports of goods and services plus net exports and monetary use of gold and silver, and (e) consumer expenditures (Table 2).

TABLE 2

Comparison of the Use of National Income
United Kingdom and United States, 1944

| | UNITED KINGDOM £ million | UNITED STATES $ billion |
|---|---|---|
| Income devoted to: | | |
| Consumption | 4,752 | 107.3 |
| War | 4,493 | 86.3 |
| Nonwar domestic capital formation | –178 | –6.9 |
| Net new external credits & additions to gold stocks | –655 | –2.2 |
| Total | 8,412 | 184.5 |

Figures are net of indirect taxes.

An intercountry comparison of income devoted to capital formation as a percentage of total income (or rather of the extent to which national income has been supplemented by a draft on national wealth) based on the figures in Table 2 is subject to two serious qualifications:

Net capital formation represents gross capital formation less normal charges for depreciation, depletion, and replacement expense. In addition to such normal charges it is important to take account of such special wartime items as bombing damage and the sinking of merchant ships by enemy action, and perhaps too of the more intensive use of industrial plant and equipment. Since the first two items are particularly important in the case of the United Kingdom, the extent to which its capital has been depleted in recent years is materially understated in the national income figures, perhaps by 30 percent.

In distinguishing between income devoted to war and to capital formation, a variety of expenditures treated in Table 2 as for war purposes may, in fact, provide items that will add to postwar national wealth; e.g., (a) construction and equipment of munitions plants; (b) construction and equipment of air fields, hangars, etc; (c) construction of emergency housing in war centers; (d) construction of barracks, military hospitals, etc.; (e) merchant ship construction; (f) increase in war inventories (materials, goods in process, etc. in the hands of manufacturers); (g) production of military goods such as trucks and communication equipment. It is difficult during the war to value the surpluses that may subsequently be left under these headings on a basis that will indicate their contribution to nonwar capital formation. The fact that they exist, though they

cannot be valued as capital formation in the year they are produced, tends to indicate that nonwar capital formation is underestimated during wartime. Rough calculations of the costs of items a, b, c, and e, exclusive of emergency type merchant vessels, totaled for the United States up to the end of 1944 almost $27 billion. Manufacturers' inventories amounted to perhaps another $10 billion. Thus, the 1942–44 capital depletion in the United States national income accounts of some $22 billion could easily be completely offset if war surpluses were to find sufficient postwar uses at home or sufficient demand abroad.

In the case of the United Kingdom's figures it is believed that such offsets to capital depletion have been much less important. One reason has been the reliance of the United Kingdom upon the conversion of existing facilities rather than upon the creation of new facilities to meet war needs; another, the relatively greater proportion of war expenditures in the United States devoted to munitions production.

In view of these considerations the CPRB report concluded (p. 2): "In all three countries addition to the stock of nonwar buildings and capital equipment ceased, many capital goods were not replaced as they wore out, and business inventories of civilian goods were run down. When peacetime uses of war surplus property (munitions plants, army trucks, merchant ships, etc.) are taken into account, however, only in the case of the United Kingdom was there a net reduction in national wealth, i.e., in productive capacity and command over foreign resources, and there the reduction was a material one".

An attempt was also made to compare consumed income as a component of total income in the United Kingdom and the United States. Treatment of lend-lease aid complicates comparisons of consumption. It is important to bear in mind that United States aid to other countries has been included in United States income received and the aid received by the United Kingdom excluded from the United Kingdom total. To make the consumption figures comparable, international aid received by the United Kingdom for consumption purposes is added to its consumer expenditures and subtracted from its war expenditures. This is the established White Paper procedure. However, in the case of the United States, the income devoted

to war that represents international aid is not strictly income received. On the other hand, since the United Kingdom figure does not include international aid received (war expenditure is decreased by the amount consumption is increased) total national income does not represent income received to the extent of such aid.

To determine the quantity of international aid received by the United Kingdom alone is difficult, particularly when it comes to military items. Is a tank lend-leased to British forces in Egypt aid to the United Kingdom or to Egypt? What if the forces are Australians? What about a tank going to British troops operating under an American general? The concept of *national income received* becomes blurred during a war in which several nations are engaged in a common cause.

Table 2 in effect assumes that 'international aid' does not influence the external debt or credit of a country. To the extent that such 'aid' provided by the United States (less reverse lend-lease) may eventually give rise to a new funded indebtedness of the United Kingdom to the United States, the war expenditures and capital depletion of the latter are overstated, and those of the former understated. For such 'aid', viewed in retrospect, should have been considered part of United States nonwar capital formation — that is, an addition to the United States external credit — rather than part of United States war expenditures; and conversely, any postwar acknowledgment of indebtedness on account of wartime 'aid' would retroactively add to United Kingdom war expenditure and capital depletion. Until a final settlement is made on lend-lease account, national income statistics for the war years must remain tentative and subject to revision so far as they are taken to measure changes in national wealth. International indebtedness after World War I raised similar difficulties.

Broadly, these difficulties may be summed up as inhering in (a) the difficulty of determining at the time the addition to or depletion of the world's wealth during a war year; (b) the fact that deferred redistributions of national claims on total wealth due to wartime transactions may be made long after the war is over. The first difficulty may be largely confined to the war and immediate postwar period; the second cannot. Moreover, this second difficulty has its peacetime analogue. Deferred redistri-

butions of national claims on world wealth may be caused by a world depression as well as by a world war.

So much for problems of comparing income component ratios. In connection with the CPRB report, an attempt was made also to develop certain gross national product component ratios. For this purpose it was proposed that the gross national products of the two countries be allocated to four components: nonwar exports; war production; domestic capital formation; consumption.

This type of analysis of gross national product and the analysis of national income in Table 2 start from different viewpoints. The expenditure analysis in Table 2 applies to the income received; had the gross national product analysis illustrated in Table 3 been on a net basis, it would have applied to national income produced. It shows the types of product derived from an economy rather than the types received by it. The purpose of such an analysis is a short time one — to show what a nation can do in the way of a war effort, that is, what the other forms of product are that might conceivably be decreased in order to devote additional resources to war production.

TABLE 3

Uses of Gross National Product
United States, 1943

| | $ BILLION |
|---|---|
| Nonwar exports | 2.1 |
| War production | 79.1 |
| Domestic capital formation | 5.9 |
| Consumed domestic product | 98.3 |
| Total | 185.4 |

Figures for each item are net of estimated indirect taxes and imports.

An intercountry component ratio comparison based on this type of analysis avoids to a large extent the difficulties discussed above. But it encounters others. It is necessary to allocate not only indirect taxes but also imports. Because of difficulties in the latter allocation, figures were not completed for the United Kingdom.

The comparisons used in the report, therefore, were crude ratios, i.e., the numerator was war outlay less estimated indirect taxes but not less imputed imports. The resulting ratios in

1943 and 1944 — for the United Kingdom (and Canada) about one-half; for the United States, 40 to 45 percent — are subject to two main qualifications, which in part at least neutralize each other.

The ratios, particularly that for the United Kingdom, may be overstated because of included imports. But even had it been possible to determine the extent of the overstatement due to this factor, the fact of imports would still lead to incomparability. Because the United Kingdom imports relatively more of the necessities of life, it was able to devote relatively more of its resources to war production. This suggests that a limit to the percentage of total product going to war may be imposed by strategic and tactical considerations such as insular position and the status of submarine warfare.

The price structures of the two economies differ materially. There is reason to think that, were it feasible to value all United States production at United Kingdom prices, the ratio of war product to total gross national product for the United States would be lower than it is at United States valuations. This consideration applies particularly to military pay, and in less degree to munitions prices.

In interpreting the war-product component ratio there is need to consider not only these two qualifications but also other factors, including (a) prewar excess capacity as indicated by the percentage of the labor force that was unemployed; (b) how long the war component ratio was at a given level.

Broadly, the ratios of war product to total product seem consistent with information on employment. Nonfarm civilian employment was allocated in accordance with rules of allocation that could be applied to the data for both countries. If all agriculture is classified as nonwar, the ratio of military plus civilian war employment to total employment for the United States for June 1944 was 41 percent, slightly lower than the United States war product ratio given above; the corresponding ratio for the United Kingdom was 55 percent, slightly higher than the United Kingdom war product ratio. In view of the relatively larger proportion of the United Kingdom labor force in the armed forces and the relatively larger proportion of the United States labor force on farms these relations are not surprising.

The problems of comparing component ratios disclosed by the CPRB report are dominated by wartime factors. Nonetheless, one may venture to draw conclusions of peacetime significance. It will seldom be safe to overlook the possibility that such a comparison is distorted because the concepts are not identical for different countries or because the component measured is not precisely the component it is desired to measure. Differences in price structure are also likely to distort peacetime comparisons. And it would be strange indeed if for any particular comparison there were not other distorting factors that require consideration in interpreting the component ratios.

## 2 Comparability of Measures of Intertemporal Changes

Among the various types of intercountry comparison, comparisons of intertemporal changes in physical volume measures entail relatively little in the way of intercountry cooperation in statistical effort. Something short of complete agreement on concepts may be permitted. And the same techniques of physical volume measurement need not be used by both countries for any given category.

On the basis of physical volume measures relating to consumption levels the report concluded (p. 1): "(1) In the United Kingdom aggregate per capita purchases of consumer goods and services valued at prewar prices decreased between 15 and 20 percent from 1938 to 1941, and during the following 3 years remained slightly below the 1941 level.

(2) In Canada and the United States aggregate per capita consumer purchases measured on an approximately comparable basis were in 1943 and 1944 ten to 15 percent higher than in 1939. Such purchases were at about the same level in 1943 and 1944 as in 1941." [2]

It was originally hoped to provide physical volume measures for all major components of gross national product and so to be able to present an intercountry comparison of the percentage increase in production from before the war to 1944. In addition

[2] The report called attention to the difficulty of finding comparable base years for such comparisons: "In respect to the level of employment, 1941 for Canada and the United States is a base year more closely comparable to 1938 in the United Kingdom than is 1939 for these two countries."

to the measures of physical volume relating to civilian consumption just cited, the report presented such measures for munitions production. Manyears could have been taken as a measure of the part of gross product represented by the armed forces. For purposes of arriving at total gross product, measures of war construction and nonwar capital formation are needed. These were not available for the United Kingdom. However, even had they been available, a major problem would have remained — what weight should war product have in relation to the nonwar components of total national product? With respect to total product the report merely suggests "a 60 to 70 percent increase in Canada and the United States and a materially smaller percent increase in the United Kingdom".

So far as future years are concerned, both these major difficulties should shortly be overcome. We may confidently hope that during the next decade or so war product will be so small that reasonable differences in its weighting will make little difference in the total; also, that direct estimates of United Kingdom capital formation will soon become available. In the not too distant future we should be able to compare year-to-year changes in the physical output of the two countries.

The problems encountered in this type of intercountry comparison for consumption and for munitions production in connection with the CPRB report concern largely the technique of physical volume measurement, problems that have no special aspect so far as intercountry comparisons are concerned. Consequently, they may be passed over here, though it is not intended thereby to minimize their difficulty or the extent of controversy in this area.

Because the physical volume measures for each country were made separately for the CPRB report, the committee encountered some problems in arriving at a common judgment of the resulting comparisons.

Joint effort in the development of this type of comparison was exerted chiefly in fixing a standard object classification for consumer expenditures. It was necessary to work out the details of this scheme of classification so as to minimize the extent to which existing materials on the two sides needed to be reworked

and yet avoid serious divergence in the definition of categories.[3] Had it been possible for Canadian representatives to participate in this task, three-way standardization would have been attempted, which would clearly have increased the problems. And, if in the future a standard scheme of classification is to be adopted under the aegis of the Social and Economic Council, clearly some — perhaps all — countries will have to change their statistical ways. But equally clearly such a standard classification is essential for both comparisons of intertemporal change and direct intercountry comparisons.

The adoption of any such scheme of classification entails the adoption of a definition of consumption and implies the adoption of a line of demarcation between consumption on the one hand and savings and capital formation on the other. In the case of the definition used in the CPRB report, measures of housing for the consumption category are in terms of the inventory of occupied dwelling units and rental values, not in terms of purchases. For all other consumption categories the measures are in terms of purchases and purchase prices; thus changes in consumers' inventories of all goods except dwellings are excluded from savings and from capital formation.[4]

Since this definition of consumption, which has definite advantages with respect to considerations of statistical expediency, has been widely used and is open to theoretical objection, the difficulties it entailed are of interest here. For all major commodity categories other than food, drink, and tobacco, purchases are an inadequate measure of consumption. Thus although the neglect of consumer inventories characterized the measurements for all three countries, for purposes of intercountry comparison it became necessary to note how long new

[3] Shaw's estimates of consumer expenditures for the United States were in general sufficiently detailed to permit their regrouping so that United Kingdom and United States categories could be made approximately comparable.

Restaurant meals required special treatment. The United States consumption expenditure estimates included under food the entire cost of restaurant meals. The United Kingdom estimates included under food only the estimated food cost of such meals; the remaining cost was assigned partly to miscellaneous services and partly to other groups. To bring about approximate comparability, one-half the value of restaurant meals in the United States was assigned to miscellaneous services.

[4] Strictly speaking, food consumption includes more than purchases. For example, home produced food for the farmer is included.

supplies had been curtailed in relation to the normal life of an article such as a suit of clothes. During the war purchases decreased more than use in the case of automobiles and household metal products in all three countries, and in the case of clothing and household textiles in the United Kingdom.

One conclusion of the CPRB report reads in part (pp. 2 and 3): "Per capita consumption of foods, valued at prewar prices, increased in the United States and Canada and decreased in the United Kingdom. In the latter country substantial readjustments of diet were necessary, but nutrient standards were in general maintained. Purchases of civilian clothing, of household soft goods, and of a miscellany of commodities, including cosmetics, toys, jewelry, stationery, and other paper products, increased in the United States and Canada and decreased in the United Kingdom. The low level of purchases of clothing and household soft goods was so long continued in the United Kingdom that by 1943 and 1944 consumers' wardrobes and linen closets included a large proportion of items that even by wartime standards in the United States and Canada would be classed as worn out."

The type of consumption measurement used in the case of housing was not satisfactory; it overstated the wartime level of consumption partly because quality deterioration was inadequately portrayed, particularly in the case of the United Kingdom, and partly because of a poorer distribution of housing during the war. The latter difficulty may be explained by an extreme example; in effect it treats two situations as equal in housing consumption: (a) 8 persons, 4 in each of two houses, and (b) 8 persons, 3 in each of two houses, and 2 with no housing accommodation at all. This distributive type of defect in consumption measures applied also to other consumption categories, particularly to the more durable consumer goods, new supplies of which were sharply curtailed, and to fuel.

A passage from the chapter of the CPRB report dealing with housing may be cited in this connection (pp. 38–9): "In the case of housing, consumption levels are particularly difficult to measure. No measurements have been attempted in this report for Canada. The measurements presented for the United Kingdom and the United States, in general, tell only the brighter side of the story. They show that there were more occupied dwelling

units in 1944 per thousand civilians than before the war. In the United States they show more occupied dwelling units per thousand civilians as an average, even for the six hundred-odd counties in which the civilian population increased during the war by in-migration from the rest of the country.

No good measures are available for either country to reveal the extent to which those persons who had to seek new quarters (e.g., in the United Kingdom because of bomb damage, or in the United States because of moving to a war production center) were unable to find suitable accommodation. Nor is there direct statistical evidence of the deterioration in the quality of dwellings which, particularly in the United Kingdom, is known to have occurred during the war."

Another difficulty encountered in consumption measures arises from classing as consumer expenditures some items that are properly deductions from wages, e.g., costs of work-clothes and of travel to and from the job. So far as this difficulty was common to the United Kingdom and the United States, it did not invalidate the intercountry comparisons.

The difficulties so far discussed are encountered in peacetime as well as wartime comparisons. One difficulty of little consequence in peacetime arose because the CPRB report focused on civilian consumption, not on total consumption. On this point the report says (p. 3):

"It has not been possible in some consumption measurements to separate civilian purchases from purchases by members of the armed forces, and there is reason to believe that in the case of such items as beer, amusements, railway travel, and communication services the average serviceman's expenditure was considerably above that of the average civilian. Thus, the increases in per capita purchases shown for these items overstate the true change in civilian consumption. This is particularly so in the case of the United Kingdom, where the number of troops, British and Allied, in that country was proportionately larger than in the United States and Canada."

This review of the CPRB's experience with intertemporal measures suggests the need to improve measures of consumption, savings, and capital formation. Existing measures overstate the cyclical fluctuations of consumption and understate the cyclical fluctuations of savings and capital formation.

Automobiles and probably several other consumer durables can be handled much as owner-occupied dwellings are now handled. This treatment, though not entirely satisfactory, is better than that now customary. Alternatively, a compromise between the two might be argued for. Further, some costs now classed as consumer expenditures can be clearly identified as costs of employment; such costs should be deducted from payrolls, not included in national income. But there will probably always be serious defects in our measures of consumption, especially in any definition of consumption that can be promulgated as an international standard. Economists concerned with the behavior of such measures as the savings-income component ratio will do well to keep these defects in mind.

## 3 Direct Intercountry Comparisons

In the CPRB report attempts were made to develop direct intercountry comparisons of three major components of gross national product: absolute levels of civilian consumption; absolute levels of munitions production; absolute equivalents of the pay and subsistence of the armed forces. Strictly, the items compared were slightly too gross inasmuch as it was not feasible to deduct imputed imports.[5] However, such a deduction for the purpose of direct intercountry comparisons might be thought of as applicable to the total.

Theoretically, the problem of an intercountry comparison of consumption for a given category of consumption (or for war expenditures) is analogous to that of comparing estimates for two years for the same country. Two general approaches to such absolute comparisons are possible.

Value figures at current prices for the two countries may be used and a correction applied to one, so as, for example, to convert 1938 pounds sterling into 1939 United States dollars. Such an interspatial deflation is analogous to the more familiar intertemporal deflation.

Physical volume value aggregates for the two countries may be computed, using the prices of either country as weights. Such a comparison gives essentially an interspatial physical volume index.

[5] 'Indirect taxes less subsidies' were not deducted either. However, this item affects intercountry comparisons only as it affects the relative weights of the components.

Under some conditions the deflation and the physical volume techniques, using data for either country as weights, give results not widely different. In other words, aggregative type indexes may be used without resorting to such a device as the 'ideal formula'. However, if, when price and physical volume relatives are computed for the various items of consumption, the dispersion is large, the interspatial measures may diverge and the need to strike some sort of compromise may be urgent.

In general, the dispersion of price and physical volume relatives is likely to be greater in the case of intercountry than of intertemporal comparisons. Baskets of goods and relative prices are likely to differ more sharply between countries than between near-by periods in one country. Thus, a gradual shift from coal to oil heat in the United States may not greatly distort a temporal comparison of heating standards in the United States; while the fact that virtually no oil is used in the United Kingdom seriously complicates an intercountry comparison. Hence the use of the 'ideal formula' or some other compromise is more likely to be needed in intercountry comparisons. Equity between the two nations to be compared is a further argument for the 'ideal formula'. Each nation may feel that unless its own prices and quantities are used as weights, its situation will be unfairly presented.

Intercountry comparisons of consumption levels were attempted on the following groups of the standard object classification adopted for the study: food, alcoholic beverages, tobacco, footwear, fuel and electricity, housing, clothing, and household goods. A very rough attempt was made for motor vehicles and their operation and a comparison was available for newspapers. Most of these comparisons were on a physical volume basis. In each case per capita figures were compared, the population base being varied appropriately from group to group (see Table 4).[6]

In the case of foods, only United States prewar prices were used. Special reports by a Combined Food Board committee compared prewar and wartime consumption for many groups of foods. For each country the pounds (or other quantity) of the

[6] Thus the population base used in the case of expenditures on men's civilian clothing was male civilians, aged 4 and over in the United Kingdom and aged 5 and over in the United States.

category of food consumed annually per capita were given. The task performed by the Combined Food Board committee in putting these measures on a comparable basis was a considerable one. For example, if beef consumption is to be measured in pounds, the measures must be on the same basis for both countries (live weight, dressed weight, retail cuts) or conversion factors must be developed.

For the purposes of the CPRB report, the intercountry food comparisons were made from the Combined Food Board computations by a shortcut method. The Bureau of Agricultural Economics had valued each article of food consumed in the United States in the five-year base period at prewar retail prices. Mainly on the basis of these computations, a United States prewar value per pound for each of 22 categories of food was determined. These unit values were applied to the Combined Food Board physical volume measures to derive prewar value aggregates for the United Kingdom and wartime value aggregates for both countries. It was not deemed feasible in the case of food to attempt a comparison using United Kingdom price-weights but it may be doubted that the showing would have been materially different.

For several of the other comparisons, however, the use of the 'ideal formula' proved very significant. That is to say, the use of the United States and United Kingdom prewar weights gave markedly different results; e.g., for alcoholic beverages and tobacco where price differentials were very much affected by excise taxes.

For footwear three comparisons were made: one based on physical volume data and United States prewar wholesale values, one on physical volume data and United Kingdom prewar wholesale values, and one on deflated expenditures. The physical volume comparisons used data for 6 categories of footwear. Expenditures were deflated by computing an average exchange rate. Constituent exchange rates were based on prewar prices (in shoe stores catering to working class families) of men's work shoes, men's street shoes, women's street shoes, boys' shoes, and girls' shoes in both pounds and dollars. The median rate of these five exchange rates was used to convert United Kingdom expenditures on footwear into dollars. The two physical volume value aggregate ratios, one in pounds, the other in dollars, were

close. The ratio of the dollar value of purchases in the United Kingdom to that in the United States based on the median exchange rate was somewhat lower. The mean of the two value aggregate ratios was adopted. All three comparisons may have been biased in the same direction by differences in the quality of footwear in the two countries.

The quality question was important also in the case of tobacco. An English and an American cigarette were taken to be equivalent; so was an ounce of smoking tobacco. However, the difference in quality of cigars was so marked that it seemed unwise to take an American cigar as equal to an English cigar. First, a preliminary comparison was made on the basis of cigarettes and smoking tobacco alone. Then each side of the comparison was increased by the ratio of total expenditure on tobacco to expenditure on cigarettes and smoking tobacco.

For fuel, only a single method of comparison was attempted. Here the measurement was in terms of the BTU content of the various fuels consumed instead of in terms of price weights. The comparison in terms of BTUs showed prewar residential consumption in the United Kingdom to be some 8 percent higher than in the United States. Had comparison been made on a value basis, United States consumption would have appeared larger in relation to United Kingdom consumption because of the high money value per BTU of gas and electricity and of the higher per capita consumption of these sources of energy in the United States. In any case, such a comparison must be qualified because of the differences in climate. An additional comparison, omitting the sixteen southern states and the District of Columbia from the United States figure, showed the number of BTUs used in residences per capita in the northern and western United States before the war to be about 25 percent higher than in the United Kingdom.

For only a few items of clothing and household goods were physical quantity data available for the two countries. Rough comparisons were based on deflations of the expenditure data. For each group retail prices applicable to working men's families were obtained for some forty items. A longer list had been made, but the difficulties in obtaining prices for even roughly comparable specifications on the two sides were considerable, and various items had to be rejected. The median price of vari-

ous quotations was used for each item. The resulting forty exchange rates for the two groups were widely dispersed; e.g., in clothing, the purchasing power of the dollar in terms of pounds was much lower for woolen items than for cotton.

The Bureau of Labor Statistics determined a median for each of the two sets of forty exchange rates based on a rough weighting of the various items in accordance with United States prewar consumer expenditures. These were used to provide interspatial deflators of per capita consumer expenditures on clothing and on household goods respectively. An attempt was made also to obtain exchange rates for a miscellaneous category of goods designated in the CPRB standard object classification as 'other personal effects' (perambulators, jewelry, cosmetics, sport goods, luggage, watches, etc.). Although quotations on both sides were obtained for fifteen items, it was felt that they were inadequate as a basis for a comparison.

The comparison for housing was based simply on the number of dwelling units per capita with no allowance for differences in quality. For automobiles, a rough attempt to fix limits on the relation of the United Kingdom consumption level to that in the United States was based on gasoline consumption, number of cars in operation, and number of new cars. The difference in weight of car and in gasoline consumption per mile in the two countries makes such a comparison difficult, but by any of the three criteria United Kingdom consumption before the war was clearly a small fraction of that in the United States and it was difficult to make any reasonable assumption for weighting the three criteria that would show United Kingdom consumption to be more than 25 percent of that in the United States or less than 15 percent. The figure in Table 4 (20 percent) may thus be subject to a 25 percent margin of error.

Because marked divergence in aggregative measures was frequent and because the margin of error in all the comparisons may be substantial, it seemed best to show each comparison rounded to the nearest multiple of 10 percent. The area covered by these intercountry comparisons, accounting for about 75 percent of total consumer expenditures in both countries before the war, indicates the over-all levels in the two countries. By means of the interspatial indexes for each area (the United Kingdom on the United States as a base) United States prewar expend-

itures were computed in pounds from United Kingdom prewar expenditures, and United Kingdom prewar expenditures were computed in dollars from United States prewar expenditures. Two preliminary composite indexes for the areas covered were computed and the geometric mean was taken as the final composite index for all areas of consumption covered (Table 4, last line).

TABLE 4

Direct Intercountry Comparisons of Per Capita Consumption Levels

| | United Kingdom Consumption in 1938 as % of United States Consumption in 1939 | Implied Exchange Rate ($ per £) |
|---|---|---|
| Food | 90 | 3.75 |
| Alcoholic beverages | 80 | 4.00 |
| Tobacco | 80 | 3.00 |
| Clothing other than footwear | 100 | 5.67 |
| Footwear | 100 | 6.00 |
| Housing | 100 | 6.67 |
| Fuel and electricity * | 110 | 5.75 |
| Household goods | 80 | 5.00 |
| Motor vehicles and their operation | 20 | 3.00 |
| Above groups taken together | 80 to 90 | 4.67 |

* The comparison with the United States excluding the southern states is about 80 percent.

In the absence of comparable data on either prices or physical volumes for the other consumption items, arbitrary assumptions may be made regarding the appropriate exchange rate to apply as a deflator for this area in getting an over-all comparison of consumption levels. If the exchange rate applicable to the area not covered lies between $2.50 and $7.50 per pound, then, accepting a figure of 84 percent for the covered area, the over-all British consumption level on the United States base must lie between 71 and 91 percent. On this basis the CPRB report concluded (p. 1): "In 1938 and 1939 the physical volume per capita of consumer purchases was probably between 10 and 20 percent lower in the United Kingdom than it was in the United States; with the wartime rise in the United States and fall in the United Kingdom the difference between levels in the two countries materially widened."

Despite the numerous qualifications that must attach to the comparisons for the several areas of consumption because adequate account of quality differences cannot be taken and be-

cause the information in several areas is incomplete, this general result is deemed reasonable.

As has been noted, from prices for comparable articles and value weights an exchange rate applicable to a given category of consumption can be constructed. An interspatial price index, it can in turn be used to convert United Kingdom consumer expenditures into dollars or United States expenditures into pounds. Conversely, given United Kingdom per capita expenditures on, say, food in pounds, and United States per capita food expenditures in dollars, and assuming that the United Kingdom consumption level is, say, 90 percent of that in the United States, an exchange rate for food can be computed from the formula: % U. K. food consumption is of U. S. consumption =

$$\frac{\text{U. K. per capita food consumption in pounds}}{\text{U. S. per capita food consumption in dollars}} \times (\text{exchange rate for food in \$ per £})$$

The over-all implicit exchange rate, $4.67 per £, applicable to total consumption covered by Table 4, was similarly computed from the expenditure totals and the total consumption ratio. The implicit exchange rates range from $3.00 to $6.67. On a more detailed basis, of course, the range of dispersion would be somewhat wider. For example, in the case of the directly measured rates for clothing the range was from $1.96 to $10.25 per pound.

The differences when dollar and pound weights were used were also large. In the case of alcoholic beverages the index using pound weights was 70 percent and that using dollar weights, 94 percent. Similarly, in the case of tobacco the index for cigarettes and smoking tobacco alone, using pound weights, was 79 percent; using dollar weights, 93 percent. These figures are presented to indicate the dangers in attempting interspatial comparisons of national income on the basis of price index data for broad categories, especially when the indexes fail to cover important items of consumption within categories. A detailed analysis of total consumption, such as that described above, may possibly give a result accurate for total consumption to the nearest 12.5 percent (provided the consumption concept, the interspatial measurement concept, and the periods selected for comparison are not in question). Even that degree of accuracy for such a comparison is far from certain. Any attempt

at interspatial comparison of total national income with much less detailed information using interspatial deflation at a single stroke is extremely hazardous.

Two other interspatial indexes may be described briefly. Two of the principal components of war expenditure are (a) pay and subsistence of the armed forces; (b) purchase of munitions, broadly conceived to include all types of goods (other than subsistence) purchased by government for war uses. To compare the physical quantities corresponding to (a) a very simple type of measurement was used — the number of manmonths in the armed services in each country. Various refinements might be made, but it is doubtful that the result would be greatly different.

For munitions production, interspatial physical volume indexes, covering a major part of all munitions production — over 60 percent for both countries on a value basis — had been computed by the CPRB for some time. To take account of the omitted items United Kingdom expenditures on munitions by the Ministry of Aircraft Production, by the Ministry of Supply, and by the Admiralty were separately converted from pounds into dollars. The exchange rates used for these conversions were based upon the interspatial production indexes already available, which provided, for the items covered in each area, value aggregates for United Kingdom production in both pounds and dollars (Table 5).

TABLE 5

Direct Intercountry Comparisons of 1943 War Product Segments

| | ARMED SERVICES | MUNITIONS PRODUCTION |
|---|---|---|
| U. K. product as a % of U. S. product | 55 | 25 |
| Implicit exchange rate ($ per £) | 8.67 | 6.67 |

Together these direct intercountry comparisons cover the major part of gross national product. Although the components for which direct comparisons are missing constitute a larger fraction of the total than in the case of the intertemporal comparisons, the situation is broadly similar. Domestic capital formation is an important component for which comparison is impossible. No direct intercountry comparison was attempted in the CPRB report for imports and exports, but so far as merchandise is concerned, these present no special difficulty, and

the service items are small relatively. No direct intercountry comparison was attempted for government service (nor were intertemporal measurements compared for this area); but a feasible basis, and one that might pass muster, is afforded by manyear data.

Thus the two chief obstacles to a complete, if rough, direct comparison of the gross national products of the two countries appear to be: (a) the lack of measures covering domestic capital formation; (b) the problem, largely a wartime problem, of the relative weights to assign the war product components.

Because of the central importance of the capital formation category it may be appropriate to speculate briefly about the types of measurement that could be used for it. Though there are substantial difficulties in comparing large portions of construction in terms of output, important segments of capital formation can be measured roughly. For example, intercountry comparisons might include:

For new schools constructed, number of pupil places, number of teacher-places, square feet per pupil;

For residential construction, number of dwelling units (possibly using some broad structure-type classification and appropriate weights), number of rooms;

For roads and streets, number of miles constructed and number of miles maintained, both by type;

For various types of industrial equipment and household facilities, number of units by type.

Some, impressed by the difficulties involved, may hesitate to accept the concept of a percentage relation between national levels, or to make an over-all intercountry comparison of gross products, even within so wide a range as $\pm 12.5$ percent. To such persons these proposals will seem objectionable, both because they do not cover all domestic capital formation and because they fail by a substantial margin to take full account of the qualitative aspects of the segments they do cover. Indeed, these objections would doubtless be lodged against the comparisons in Tables 4 and 5 also.

Various considerations may be offered in rebuttal. The comparisons in Tables 4 and 5 and the measures proposed above hardly exhaust the possibilities. The list could easily be extended

on the basis of data one may reasonably hope for. The comparisons in Tables 4 and 5 are practically a maiden effort. Firmer price comparisons, covering many more items of clothing, household goods, and other personal effects, are surely desirable and to be confidently expected. In this direction the CPRB report hardly scratched the surface. Measures of both the interspatial deflation and the physical volume variety can be developed for other segments of consumption. The unmeasured area can be materially narrowed and for a substantial area it should be possible some day to check one type of measure against another.

It is important to recognize that failure to take account of qualitative differences is itself a matter of degree. And the degree of failure in a given area can be diminished by improving price specifications, by pricing more items, by dividing quantity data into more detailed categories, and by measuring physical volume in more forms and more refined forms.

It is important also to recognize that the impossibility of measuring a certain segment of gross national product is not a bar to an over-all intercountry comparison for gross national product, or for total consumption. If limits can be set for the missing measure, say ±50 percent, an over-all comparison, subject to much narrower margins of error, can be made.

These considerations are mentioned to indicate both the feasibility of useful over-all United Kingdom–United States comparisons of consumption and of gross national product and the next steps in their development. But it may be well to repeat a caution sounded at the start — the task of making such intercountry comparisons will be more difficult where the cultural differences are wider than they are between the United States and the United Kingdom.

# NATIONAL INCOME ESTIMATES OF LATIN AMERICAN COUNTRIES

LORETO M. DOMINGUEZ

THIS STUDY presents national income estimates for the Latin American countries except four — Guatemala, Haiti, Costa Rica, and Nicaragua. Owing to the paucity of statistical data the estimates for most of the countries can be no more than rough approximations. In those for which the basic statistical data are available, estimates have been prepared in greater detail. The reliability of the estimates therefore varies widely from country to country, reflecting to a considerable degree the national statistical material available. This material, however, has seldom been used to its fullest extent. Native investigators, familiar with national data, have often encountered theoretical and methodological difficulties in preparing their estimates. As to the author's own contribution, the fact that the estimates were prepared in Washington, with the material obtainab e there, should go far to explain their nature and the errors that have undoubtedly been made. The important thing, however, is that more and better work is possible. The field is virtually unexplored and in many countries an experienced group of statisticians enjoying official support could produce, even with the few data, estimates in sufficient detail, classified by small enough categories, and with such narrow margins of error that they would be extremely useful tools of economic analysis and important guides for the social, fiscal, and economic policies of the countries concerned.

In preparing these estimates, studies made by investigators in the countries have been reviewed and appraised. The estimates for Uruguay, Paraguay, El Salvador, and Honduras, the first ever made, are based upon commodity production series

(agriculture, manufacturing, extractive industries, and building construction) and employment and income ratios in countries where more data were available. Obviously, these preliminary estimates must be viewed with caution and improved upon when other series can be substituted.

In a brief final section, the various national estimates are compared and converted into dollars, by means of purchasing power parities based upon the retail prices of a small group of food items consumed in every country of the hemisphere. The difficult problem of international comparisons of national income is thus faced, though no satisfactory solution has been found.

The data for this paper have been drawn from material with which the author has been working in connection with a program initiated by the Inter American Statistical Institute more than a year ago. The long range objective is to strengthen the basic economic and social statistics from which national income estimates in the American nations must be computed. The author came to the United States from Argentina to join the staff of the IASI for two years of work on national income methodology under the technical guidance of Simon Kuznets, to whom both the author and the Institute are greatly indebted. More than once the author — aware of the deficiencies of the work — continued only because of the encouragement and sympathy Professor Kuznets gave him. The estimates are released upon the understanding that they are not the final, authoritative estimates the IASI expects to issue from time to time in cooperation with the respective countries, but rather the best provisional estimates possible to make with the fragmentary data available.

## 1 Introduction

To understand the difficulties encountered in attempting to estimate the national income of the various Latin American countries, one must know the status of their statistical development.

Of the twenty countries covered by this survey, thirteen have taken population censuses since 1930,[1] but five (Brazil, Chile,

[1] El Salvador, 1930; Colombia, 1938; Brazil, Chile, Dominican Republic, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, and Venezuela, 1940; and Cuba, 1943.

Mexico, Nicaragua, and Venezuela) have not yet published the summary results of censuses taken in 1940 and 1941. Five others (Cuba, Guatemala, Honduras, Venezuela, and El Salvador), which have recently taken population censuses, omitted the gainfully occupied and its distribution by industries. This information is essential to the preparation of a reliable estimate, especially when — as is generally the case — many of the basic economic series do not cover fully the activities measured. Guatemala and El Salvador have, however, published some figures showing the occupational distribution of the population, by means of which the size and industrial distribution of the gainfully occupied can be estimated.[2] In short, only six countries offer direct census information on the gainfully occupied for some period within the last fifteen years or so, although others have official or unofficial estimates.

Agricultural, industrial, commercial, and service censuses are on the whole not much better than population statistics (Table 1). Only three countries (Venezuela, Mexico, and Chile) have recently taken censuses covering the activities of the majority of their inhabitants. Between 1935 and 1940 the Dominican Republic took a population, an agricultural, and a manufacturing census, but, as in most other countries, the information on trade and service is inadequate. Argentina took an agricultural census in 1937 and since 1935 has been making biennial surveys of manufacturing, but estimates of the industrial distribution of the gainfully occupied are somewhat contradictory. As statistical information from the other countries is even less adequate, any attempt to estimate their national income immediately entails determining the relative coverage of the series that are available. As a rule, there are data on the value of agricultural and mineral production (seldom linked to the employed population) and incomplete manufacturing series, in some cases covering only the gross value of product. In a few countries there are studies on the cost of living or family expenditures, but their coverage is quite logically confined to one or a few large cities where living conditions differ materially from those in rural or agricultural areas. Ex-

[2] For a detailed description of the status of population data in Latin America see Ricardo Luna Vegas, 'Métodos de los Censos de Población de las Naciones Americanas', *Estadística*, Journal of the Inter American Statistical Institute, March 1945.

cellent studies have been made for Medellin, Colombia, and for Caracas, Venezuela. In addition, there are usually some wage data, a few price indexes, and a few other less important series. Data on the service industries are, without exception, very incomplete and generally unsatisfactory for the purpose at hand.

Owing to the peculiarities of the economy of most Latin American countries the investigator is confronted with prob-

TABLE 1

Basic Official Data Relevant to National Income Estimating for Twenty Latin American Countries

| | GAINFULLY OCCUPIED | CENSUSES | | | | FAMILY INCOME & EXP [b] | WAGE DATA | COST OF LIVING [b] |
|---|---|---|---|---|---|---|---|---|
| | | Agr. [a] | Mfg. | Trade | Service | | | |
| Argentina | .. | 1937 | 1935 [c] | .. | .. | 1935 | x | x |
| Bolivia | .. | .. | 1940 | .. | .. | .. | x | |
| Brazil | 1920 [d] | .. | [e] | [e] | [e] | 1934 | x | x |
| Chile | 1930 | 1935–36 | 1937 | 1937 | . | .. | x | x |
| Colombia | 1938 | .. | [f] | | .. | 1936 & 38 [g] | x | x |
| Cuba | .. | .. | .. | . | .. | .. | [h] | [i] |
| Costa Rica | . | .. | .. | .. | .. | . | .. | x |
| Dominican Rep. | 1935 | 1940 | 1939 | .. | .. | . | .. | . |
| Ecuador | .. | .. | .. | .. | .. | 1942 [j] | x | |
| El Salvador | [k] | .. | .. | .. | . | .. | x | .. |
| Guatemala | [k] | .. | . | .. | .. | . | x | .. |
| Haiti | .. | .. | . | .. | .. | .. | . | .. |
| Honduras | [k] | .. | .. | .. | .. | . | | . |
| Mexico | 1930 [l] | 1930 | 1935 [l] | 1939 | . | 1934 | x | x |
| Nicaragua | [k] | .. | . | . | .. | . | .. | .. |
| Panama | 1940 | 1943 [m] | | . | | | . | . |
| Paraguay | .. | .. | [n] | . | . | | x | |
| Peru | 1940 | .. | [o] | . | . | . | x | x |
| Uruguay | . | 1937 | 1936 | . | . | | x | x |
| Venezuela | [p] | 1937 | 1936 | 1936 | 1936 | 1939 | x | x |

x Periodic data.

No data or censuses.

[a] Practically all countries have value of production series, although it is seldom possible to determine what part of total production is covered.

[b] This list may be incomplete since most of the investigations are for a specific place and time, and some may have escaped our review.

[c] Biennial censuses have been taken since 1935; the latest is for 1941.

[d] The industrial distribution of the gainfully occupied resulting from this census was quite unsatisfactory and has been changed considerably.

[e] The results of these censuses have not yet been published. For manufacturing there are some value of production estimates based on excise tax figures.

[f] The industrial series do not cover all manufacturing activities.

[g] Studies for the City of Bogota in 1936 and Medellin in 1938.

[h] Through the social insurance system, figures on total wage and salary payments in private industry are published. They are not, however, related to employment data.

[i] Cost of food index.

[j] Over-all study of food consumption by the total population.

[k] The censuses did not show the gainfully occupied, but did give the occupational distribution of the population.

[l] The summary results of the 1940 Census have not yet been published.

[m] Only incomplete results have been published. The census covers only the District of Penonome, which is considered 'typical'.

[n] Incomplete figures on value of production.

[o] Only a few incomplete series available.

[p] Results for only the Federal District and the State of Anzoategui have been published.

lems statisticians and economists of the more developed countries do not have. The correlation between the degree of economic development of a country and the quantity and reliability of its data should not surprise anyone. In modern economies, where manufacturing is important and markets are well organized, statistical information on the many phases of economic processes is essential to the successful management of both private and public enterprises. In such countries, data otherwise expensive to collect and publish are quite often a byproduct of the economic activities since competition compels every business man to rely upon statistical information. Consequently, there is not only a willingness to provide information to the collecting statistical agencies, but also a keen demand for their figures. On the other hand, in countries where the greater part of the output consists of agricultural products or handicraft articles for home consumption or for sale in small regional markets where competition is limited, such data are by no means essential. Furthermore, in these economies the need for governmental supervision, management, or planning is not so great, or in any case the demand for it is not felt.

Large non-monetary or non-market economies — superimposed, it is true, upon more developed groups — and the consequent paucity of data give rise to the first basic problem in attempting to estimate national income in Latin America. To a greater or lesser degree the estimates presented here are affected by the limitations of the data on agricultural output produced for home consumption or for exchange on a commodity basis for other products or services. Though non-recorded production was estimated, there is no assurance that the coverage is complete. The great importance of production for direct consumption is evident from Table 2, which shows that in only five countries (Argentina, Uruguay, Chile, Panama, and Cuba) are relatively large proportions (between 32.7 and 42 percent) of their inhabitants engaged in transportation, trade, finance, and other services. But even these percentages are smaller than those for the United States and Canada. The high figure for Panama, 36.4 percent, is explained by the peculiar position of the country, which enjoys a thriving tourist trade from the Canal Zone and receives a large share of its income from wages and salaries of Panamanian nationals employed in the Zone. In

the other countries employment in service industries is less than 24 percent, and as low as 6.7 percent in Bolivia. The extremely high employment figures in agriculture can be explained only by its low productivity. In three countries where agricultural

TABLE 2

Seventeen American Countries

Percentage Distribution of the Gainfully Occupied

| | | TOTAL | AGRICULTURE | MINING | MFG. | SERVICES |
|---|---|---|---|---|---|---|
| United States | 1940 | 100.0 | 18.0 | 2.0 | 28.9 | 51.1 |
| Canada | 1941 | 100.0 | 28.4 | 1.8 | 21.7 | 48.1 |
| Argentina | 1937 | 100.0 | 42.4 | | 16.0 | 42.0 |
| Uruguay | 1937 | 100.0 | 45.0 | 0.3 | 13.1 | 41.6 |
| Chile | 1930 | 100.0 | 34.7 | 5.3 | 19.6 | 40.4 |
| Panama | 1940 | 100.0 | 52.3 | 0.2 | 11.1 | 36.4 |
| Cuba | 1942 | 100.0 | | 67.3 | | 32.7 |
| Brazil | 1940 | 100.0 | 69.4 | | 6.7 | 23.9 |
| El Salvador | 1930 | 100.0 | 73.0 | | 5.1 | 21.9 |
| Honduras | 1940 | 100.0 | 72.4 | 0.6 | 7.7 | 19.3 |
| Colombia | 1938 | 100.0 | 62.0 | 2.4 | 16.9 | 18.7 |
| Peru | 1940 | 100.0 | 62.5 | 1.8 | 17.2 | 18.5 |
| Guatemala | 1940 | 100.0 | 71.1 | | 12.5 | 16.4 |
| Mexico | 1930 | 100.0 | 70.0 | 14.4 | | 15.6 |
| Dominican Republic | 1935 | 100.0 | 84.3 | | 6.2 | 9.5 |
| Venezuela | 1936 | 100.0 | 84.7 | 1.4 | 5.6 | 8.3 |
| Bolivia | 1940 | 100.0 | 88.7 | 3.5 | 1.1 | 6.7 |

Sources of data are the respective population censuses, except in a few countries such as Argentina, for which the gainfully occupied have been estimated to be about 35 percent of the total population.

The distribution by industries is based on information from the Agricultural Census and manufacturing surveys. Other sources of information are given in the respective national income estimates in Section 2 of this study.

There are no data for Costa Rica, Nicaragua, Haiti, Ecuador, or Paraguay.

employment is relatively low (Argentina, Uruguay, and Cuba), the industry is very specialized, utilizes a great deal of machinery, and is carried on under extremely favorable soil and climatic conditions. In another country with low agricultural employment, Chile, the industry, though not geared for export as in the other three countries, is influenced also by favorable natural conditions. In addition, Chile has a productive mining industry. Service industries in the other countries are in general undeveloped, and few products are exported (see Table 3).

Among the lesser problems at least one or two should be pointed out. In many countries where the data are not sufficiently detailed, transfers abroad of interest and dividends on

foreign capital investments cannot be allocated to the original industrial sources. Consequently, the only practical solution is to undertake a final adjustment of the total national income resulting from interest and dividends paid out or received from

TABLE 3

Twenty Latin American Countries Classified by Their Chief Exports, 1938

| | CHIEF EXPORTS | % OF TOTAL EXPORTS |
|---|---|---|
| | *Diversified Agricultural Exports* | |
| Argentina | Wheat, corn, linseed, flour, meats, wool, hides, skins | 82.3 |
| Uruguay | Wool, meats, hides, linseed | 83.4 |
| Paraguay | Cotton, yerba mate, quebracho extract, cattle hides, animal products | 87.9 |
| | *Mainly Mineral Exports* | |
| Bolivia | Tin, silver, tungsten | 81.0 |
| Chile | Copper, nitrates, iodine | 80.6 |
| Peru | Petroleum, copper, cotton, sugar | 77.5 |
| Venezuela | Petroleum and derivatives | 93.3 |
| Mexico | Lead, zinc, petroleum, copper, silver, gold | 71.4 |
| | *Non-diversified Agricultural or Mineral Exports* | |
| Brazil | Coffee, cotton | 63.2 |
| Colombia | Coffee, bananas, petroleum | 93.5 |
| Ecuador | Cocoa beans, coffee, rice, petroleum, cyanide precipitates, silver, gold | 76.0 |
| Costa Rica | Coffee, bananas, cocoa beans, gold | 90.0 |
| El Salvador | Coffee, gold | 92.3 |
| Guatemala | Coffee, bananas | 88.4 |
| Honduras | Bananas, silver, gold | 92.3 |
| Nicaragua | Gold, coffee, bananas | 81.9 |
| Panama | Bananas, cocoa beans | 85.4 |
| Cuba | Sugar, tobacco | 88.3 |
| Dominican Republic | Sugar, cocoa beans, coffee | 81.0 |
| Haiti | Coffee, cotton, sugar, sisal, bananas | 91.3 |

Summarized from *The Foreign Trade of Latin America* (U. S. Tariff Commission, 1942) Vol. 1 and 2. Only exports constituting more than 5 percent of the total value of exports in 1938 are included in this table.

foreign investments. The problem is, of course, not confined to Latin American economies, but exists in every country where there are foreign investments. The feature that characterizes Latin America is that foreign corporations are engaged in the exploitation and exportation of natural resources in a raw or semi-processed state; e.g., Chilean copper, Bolivian tin, and Venezuelan oil. The products are priced in foreign markets, but only after transportation, insurance costs, etc. have been added and the products have undergone a certain amount of processing. The practice usually followed by foreign corporations is to bring into the country, from the proceeds of sales, enough funds to pay current expenses, such as fuel, wages and salaries, and

taxes, and leave net profits abroad. A part of the profits may be reinvested in machinery and equipment, imported, as a rule, free of duty.

If the purpose of the national income estimate is to show the part of national income available for consumption or investment by the respective nationals, rather than the total originating in the country, the problem disappears when income items transferred abroad are ignored. This procedure, so far unavoidable, obscures valuable information on the real importance of a given industry to a country. In Venezuela, as will be seen in Section 2, the contribution of the oil industry to the national income is a small fraction of recorded oil exports, although the system by which the latter are evaluated seems somewhat arbitrary. Provisional estimates for Chile show that only about 7 percent of its national income originates in mining, although the industry is obviously much more important than this percentage indicates. Partly, at least, this is due to the proportionally heavy taxation to which the mining industry is subject. Since corporate taxes are excluded from the net income of the industry paying them, the industry's contribution to the economic welfare of the country is not readily disclosed unless the respective taxation figures also are presented.

During the depression of the 1930's most of the countries exporting raw materials found themselves with shrinking foreign exchange reserves, which compelled them to cut imports and other expenditures abroad. Many stopped, partly or completely, the payment of the principal or interest, or both, on indirect foreign investments. In addition, several of the issuing countries were able to buy their bonds in foreign markets at prices well below their nominal values.

Perhaps the proper treatment of the sums not transferred abroad is, in cases of moratoria, to include them as a negative item in government savings. The redemption of bonds below the nominal issuing value is probably more debatable. As a rule, profits derived from the revaluation of capital assets within a country are excluded from its national income. When two countries are involved, the country buying its foreign debt at bargain prices is obviously obtaining a real, not a purely nominal gain.

## 2 Available Estimates

Obviously, estimating the national income of Latin American countries is, in some ways, similar to solving a jigsaw puzzle when some — and in certain cases, many — pieces are missing. Data for most Latin American countries are still far from a state that would admit of detailed estimates as reliable as those for the United States. This defect will become more apparent as the various estimates are reviewed. Their accuracy necessarily varies with the abundance and quality of the data. Some give merely an over-all picture of the total national income with elementary divisions determined by the source material rather than by logic. For a few countries data are so scarce that it is impossible to prepare even the crudest estimate.

Despite the insufficiency of the material, in a few countries attempts to estimate national income were made as long as twenty-eight years ago — in Argentina by Alejandro Bunge, in Brazil and Mexico somewhat later by Bento Miranda and Alanís Patiño. Another pioneering series of estimates was prepared about ten years ago by Raúl Simón of Chile. However, these few estimates are exceptions. The estimate for Brazil (1926) is somewhat crude and inaccurate, but the other investigators had at their disposal a variety of data available nowhere else in Latin America. Ing. Bunge was able to use the results of the then recent (1914) general census (population, manufacturing, etc.) and the agricultural census of 1908, as well as several series of which some were later discontinued. The situations in Chile and Mexico were similar when Simón and Patiño undertook their studies. The above estimates, fruits of the interest and curiosity of individual investigators, did not stimulate sufficient interest to be expanded or improved. Those of Ing. Simón for Chile were continued until recently by a simplified method.

Still, insufficiency of material may not be the sole explanation for the slight interest shown in Latin America in national income studies. Until very recently economic thinking was focused on foreign trade and monetary subjects. Consequently, there is a more generalized interest in financial, banking, and trade series and in balance of payments estimates than in national income.

The estimates mentioned above are apparently the only ones published until 1940 or so. The emphasis the war placed on national income, industrial capacity, and taxation, and the current trend in economic thinking, which stresses national income concepts, stimulated the more recent estimates.

Since 1940 estimates have been increasing steadily in number. New interest was aroused by the Monetary Parley of Bretton Woods, where the forty-four signatory countries agreed to provide "such information as it (the Fund) deems necessary to its operation, including as the minimum, for the effective discharge of the Fund's duties, national data on the following matters ... national income".[3] These data were requested also at the International Aviation Parley in Chicago [4] and at the San Francisco Conference. But, as has been pointed out, the basic statistical material is so inadequate that a majority of the new estimates are influenced by subjective decisions of the computers or provide only a total figure without useful subdivisions.

## A *Argentina*

### (1) *Estimate of Alejandro E. Bunge, 1916* [5]

In addition to the national income estimate reviewed here, Bunge gives several other estimates, among them national wealth in 1908 and 1916. The methodology of the former is said to be similar to that of investigations undertaken by the United States Census Office.[6] One chapter deals with the purchasing power of money and compares the cost of living in Argentina and the United States. Several others treat governmental expenditures and the tax structure.

The total national income of Argentina was estimated in two parts. The first is based on the 'yield of productive capital', which in essence includes profits, interest on capital, and rent

[3] Art. VIII, Sec. 5, Point 8, of the Articles of Agreement.

[4] The Civil Aeronautics Board in cooperation with the Financial Section, Latin American Unit, Bureau of Foreign and Domestic Commerce, prepared for this purpose a set of national income estimates.

[5] *Riqueza y Renta de la Argentina—su Distribucion y su Capacidad*, Contributiva (Agencia General de Libreria y Publicaciones, Buenos Aires, 1917).

[6] Special reports of the United States Census Office, *Wealth, Debt and Taxation* (Department of Commerce and Labor, 1907 to 1915).

on land. The second covers income from 'individual work' and includes wages and salaries, incomes of domestic workers, and of business men and professionals.

(a) YIELD OF PRODUCTIVE CAPITAL. Somewhat similar figures were derived by two methods. One, utilizing the results of the 1914 General Census, shows the real wealth of the country, divided into two categories: 'productive' and 'unproductive'. The yield of productive wealth was 1,090 million pesos or 4.5 percent of the total. The other method is more elaborate and utilizes a considerable variety of data. As in the first method, in some cases a yield was also assumed for certain types of capital goods. In general the estimate seems conservative and the yields selected — when no direct figures were available — are usually low (Table 4).

TABLE 4

Argentina

Yield of Capital

Alejandro E. Bunge's Estimate

| | YEAR | VALUE (thousands of pesos) | YIELD (thousands of pesos) | % YIELD |
|---|---|---|---|---|
| Total | | 24,984,795 | 945,852 | 3.8 |
| *Territorial property* | | 12,344,000 | 428,560 | 3.5 |
| Exploited land [a] | 1915–16 | 6,520,000 | 195,600 | 3.0 |
| Urban & rural buildings [b] | 1915–16 | 4,750,000 | 190,000 | 4.0 |
| Rural installations | 1915–16 | 1,074,000 | 42,960 | 4.0 |
| *Capital applied to land* | | 4,853,000 | 194,000 | 4.0 |
| Forestry & mines | | [c] | [c] | |
| Agricultural machinery & equipment | 1914 | 1,650,000 | [c] | |
| Cattle | 1914 | 3,203,000 | 194,000 | 6.0 |
| *Other capital* | | 7,787,793 | 323,292 | 4.2 |
| Railroads | 1915 | 3,375,066 | 103,441 | 3.1 |
| Corporations (soc. anon.) | 1914 | 1,017,000 | 50,065 [d] | 4.9 |
| Banks, etc. (noncorp.) | 1913–14 | 385,524 | 19,276 | 5.0 |
| Manufacturing | 1908–15 | 1,330,203 | 66,510 | 5.0 |
| Trade | 1910–16 | 1,680,000 | 84,000 | 5.0 |

Data on territorial property are from the 1914 General Census; on urban and rural buildings, from the 1908 Agricultural Census; those for railroads, industry, and commerce are adjusted official figures and estimates.

This table is, with slight changes, a summary of Tables 87, 88, and 89 in *Riqueza y Renta de la Argentina.*

[a] Includes 100,000 Hs. used by cities and towns, out of a total of 93,000,000 Hs.
[b] Excludes public buildings, schools, parks, etc.
[c] Omitted to avoid duplication.
[d] Gross profits amounted to 80.6 million pesos. The figure given is for dividends distributed.

The figure for the 'yield of capital' finally included in the national income estimate was 1,030 million pesos, an amount between the two estimates.

(b) INCOME FROM INDIVIDUAL WORK. Income from individual work is based upon an estimate of the gainfully occupied from the 1914 Census and various figures on average earnings. Ing. Bunge reclassified the Census figures into three main groups, the first two of which cover workers and other persons with relatively low incomes, while the third is for the higher brackets (Table 5).

TABLE 5
Argentina
Gainfully Occupied, by Industry, 1914
Alejandro E. Bunge's Estimate

| | TOTAL | GROUP A | GROUP B | GROUP C |
|---|---|---|---|---|
| | (thousands) | | | |
| Total | 3,233.1 | 2,272.6 | 368.2 | 541.6 |
| Agriculture & cattle raising | 529.9 | 462.5 | 2.3 | 65.1 |
| Industry & crafts | 841.2 | 807.3 | | 33.9 |
| Trade | 296.3 | 5.6 | 28.8 | 259.3 |
| Transportation | 110.8 | 97.8 | 9.2 | 3.8 |
| Real estate & movable property | 63.5 | | | 63.5 |
| Domestic service | 218.6 | | 218.6 | |
| National defense | 9.6 | | | 4.8 |
| Public administration | 108.9 | | 76.2 | 32.7 |
| Religion | 5.6 | | 5.6 | |
| Jurisprudence (law) | 9.1 | | | 9.1 |
| Health (sanitary professions) | 14.8 | 3.1 | 1.5 | 10.2 |
| Education | 83.2 | | 0.8 | 39.1 |
| Fine arts | 14.2 | | 3.3 | 10.9 |
| Arts & sciences | 8.8 | | | 8.8 |
| Sports & physical culture | 2.0 | | 1.8 | 0.2 |
| Misc. & improperly designated | 919.3 | 896.3 | 20.1 | 0.3 |

*Riqueza y Renta de la Argentina*, pp. 95–7. Several small errors have not been corrected; the 'Total' column agrees with Census results, but the sum of columns 'A', 'B', and 'C' does not check with this total because certain figures under 'Education', 'National defense', and 'Miscellaneous' were omitted, totaling 50.7 thousand persons. The Census also listed 1,793.7 thousand persons over 14 years of age, of whom 1,536.0 were women for whom no occupation was given. This group is, perhaps correctly, excluded from Bunge's estimate. On the basis of the above figures the gainfully occupied constituted 40 percent of the total population, according to the Census.

*Group A.* The average earnings of Group A are based on the results of two surveys undertaken by the National Labor Department (Departamento Nacional de Trabajo), covering 221 families (1,154 individuals) in 1913 and 156 families (768 individuals) in 1914. The average income per worker was 1,086 pesos. Ing. Bunge points out that more children under 16 years

of age worked in cities than in agricultural areas. On the other hand, as the proportion of wage earners with particular skills and higher pay was larger in cities, the above-mentioned figure is probably characteristic of the country as a whole. On this basis, the income of Group A was 2,048.4 million Argentine pesos.

This estimate may be checked by another approach. Average daily wages published by the National Labor Department for 'male adults', 'female adults', and 'children' were weighted according to the age and sex distribution of the working population. On the assumption that the number of working days per year is 300, the estimate is 1,934.6 million pesos, 113.8 million less than the first estimate.

*Group B.* Group B is composed of 368.2 thousand persons, of whom 172.9 thousand are women. It is subdivided into domestic servants, 218.6 thousand persons; administrative employees, 72.9 thousand persons; and 'other' (low income), 76.7 thousand persons.

Domestic servants are attributed an average income per year of 851 pesos, or about 25 percent less than that of Group A. Administrative employees are assumed to have an average annual income of 1,111 pesos, the equivalent of that earned by all government employees (federal, state, and municipal) below the 2,000 pesos a year level, which would roughly correspond to the definition of Group B. The 'other' group is attributed the same average. Accordingly, Group B would have an income of 352 million pesos.

*Group C.* The persons in Group C were attributed an average income equal to that flowing to all government employees (federal, state, and municipal) above the 2,000 pesos a year level: 3,882 pesos. Ing. Bunge points out that a special, though limited, survey he undertook showed that the income of persons engaged in trade (small owners, managers, etc.) was not below the average for medium and highly paid government employees. On this basis, the total income of Group C was 2,102.0 million pesos.

*Total national income.* In assembling the final figures income from capital is given as 1,030 million pesos, whereas the two figures derived were 1,090 and 945.0 million pesos (Table 6).

In the final total the part that goes to foreign residents on their investments in Argentina, 206 million pesos, was estimated on the basis of foreign investments, 5,000 million pesos. Another capital item is 'income from natural capital', defined as income

TABLE 6
Argentina
Total National Income, 1916
Alejandro E. Bunge's Estimate

| | TOTAL | INCOME FROM PERSONAL WORK | YIELD OF CAPITAL |
|---|---|---|---|
| | (millions of pesos) | | |
| Wage earners | 2,022.1 | 1,935.0 | 87.1 |
| Domestic service & other | 367.9 | 352.0 | 15.9 |
| Business and professional men, etc. | 2,823.0 | 2,102.0 | 721.0 |
| Total | 5,213.0 | 4,389.0 | 824.0 |
| Foreigners, non-resident | 206.0 | | 206.0 |
| Total national income | 5,419.0 | 4,389.0 | 1,030.0 |

*Riqueza y Renta de la Argentina*, p. 146.

from personal work applied to personal capital and covering the value of fruits, vegetables, etc. produced and consumed by households. The estimate is simply 10 percent of the income from capital, or 103.0 million pesos, allocated between workers (87.1 million) and persons in domestic service and 'other'.

### (2) *Ministry of Finance Estimate, 1941*

In the Ministry of Finance estimate there are certain discrepancies between the concepts or definitions said to have been adopted and the statistical items actually computed. In its final form the estimate covers wages and salaries paid, profits, rent of land and buildings, including residential, plus depreciation on machinery, equipment, and buildings. Interest on capital seems to have been omitted and no adjustment for transfers abroad of this item was made.

The depreciation figures are given separately for each industrial group so that they can easily be subtracted to obtain a net income concept. The only exception is in 'Wholesale and retail trade', for which 1,260.4 million pesos, representing both profits and depreciation, is given. A reduction of 12 percent in the national income figures so obtained was finally made in order to obtain 'net national income'. It is indicated that this percentage is based on United States estimates. On the whole it

seems, nevertheless, that the final results do not differ greatly from those which would have been obtained by following a more direct method and using purely national data.

The contribution of government (national, state, and municipal) was computed by taking personal payments (wages and salaries) and interest on and amortization of the public debt.

Income originating in agriculture and cattle raising was estimated by deducting certain cost items from the gross value of production. Some of the data are from a special sample survey of 1,000 farms. For all the other industrial groups a payments approach seems to have been adopted. Table 7 was transcribed,

TABLE 7

Argentina
National Income, 1941
Ministry of Finance Estimate

| | | MILLIONS OF PESOS |
|---|---|---|
| 1 | Agriculture, forestry, & cattle raising (lines 2–6) | 2,831.3 |
| 2 | Agriculture (lines 2a–e) | 1,453.8 |
| | a Rent of land | 429.1 |
| | b Cereals & linseed | 479.8 |
| | c Fruits | 216.1 |
| | d Vegetables | 158.2 |
| | e Other (incl. 1/10 of the output of feed & fodder) | 170.6 |
| 3 | Forestry (wages, salaries, & rent of land) | 121.2 |
| 4 | Cattle and dairy (lines 4a–c) | 933.3 |
| | a Food & fodder produced by the cattle raising industry | 295.5 |
| | b Rent of land | 366.6 |
| | c Wages, salaries, and profits | 271.2 |
| 5 | Poultry raising, hunting, & fishing (wages & profits) | 98.0 |
| 6 | Dairy industry | 225.0 |
| 7 | Mining (lines 7a–c) | 64.0 |
| | a Rent of land | 11.4 |
| | b Wages & salaries in cash & kind | 37.4 |
| | c Profits | 15.2 |
| 8 | Manufacturing (lines 8a–b) | 1,769.7 |
| | a Wages & salaries in cash & kind | 1,131.6 |
| | b Profits | 638.1 |
| 9 | Building construction (lines 9a–b) | 105.7 |
| | a Wages & salaries in cash & kind | 75.7 |
| | b Profits | 29.9 |
| 10 | Electricity & gas (lines 10a–b) | 132.9 |
| | a Wages & salaries in cash & kind | 54.5 |
| | b Profits | 78.4 |
| 11 | Depreciation on mining, manufacturing, building construction, & electricity & gas | 250.0 |
| 12 | Total productive industries (lines 1 + 7 + 8 + 9 + 10 + 11) | 5,153.5 |
| 13 | Communications (wages, salaries, profits, & amortization) (lines 13a–c) | 76.4 |
| | a Radio | 5.0 |
| | b Telephone | 59.7 |
| | c Telegraph | 11.7 |

TABLE 7 (*Continued*)

| | |
|---|---|
| 14 Transportation (lines 14a–c) | 502.0 |
| a Railroads | 290.4 |
| b Merchant marine | 70.3 |
| c Other | 141.3 |
| 15 Wholesale and retail trade (lines 15a–b) | 2,332.8 |
| a Wages and salaries | 1,072.4 |
| b Profits and depreciation | 1,260.4 |
| 16 Total distribution industries (lines 13 + 14 + 15) | 2,911.3 |
| 17 Government (wages, salaries, interest, & amortization) (lines 17a–c) | 1,689.2 |
| a Federal | 1,007.3 |
| b State | 405.7 |
| c Municipal | 276.2 |
| 18 Finance (wages, salaries, commissions, & profits) (lines 18a–d) | 167.3 |
| a Banks | 115.1 |
| b Insurance | 51.2 |
| c Other | 16.0 |
| d Difference between interest collected & paid | –15.0 |
| 19 Real estate (lines 19a–b) | 702.9 |
| a Net rentals | 427.3 |
| b Depreciation | 275.6 |
| 20 Professions (wages and fees) | 164.4 |
| 21 Total service industries (lines 17 + 18 + 19 + 20) | 2,723.9 |
| 22 Total (lines 12 + 16 + 21) | 10,788.6 |
| 23 Net national income (88% of line 22) | 9,494.0 |

*Revista de Economica Argentina*, Año XXVI, No. 318, Dec. 1944, pp. 406–12.

with minor changes and the sources of data omitted, from the *Revista de Economica Argentina*.

### (3) *Central Bank Estimate, 1935–45*

At the beginning of February 1946 the Central Bank of Argentina published a new national income estimate by industrial origin covering 1935–45. National income is defined as "the sum total of all goods and services produced in the country in a given year". The contribution of each economic or industrial group is the 'value added', i.e., the difference between the sales value of its product and the payments made to other industries in order to carry on its productive processes. The method of of computation, set down in detail, indicates that no deductions have been made for depreciation on machinery, equipment, and buildings, as well as business taxes. 'Value added' is made up, then, of *all the sums earned by the productive factors, plus capital consumption and business taxes*. Except for minor adjustments, such as changes in business reserves and inventory revaluations, the resulting figures, a form of 'gross national product', are not what is generally understood by national income. The only

apparent difference between it and gross national product as computed by the United States Department of Commerce is that governmental services, in the Central Bank estimate, include labor payments alone. Interest on the public debt is not computed. Unfortunately, figures for depreciation and business taxes are not given in the report; it is therefore impossible to make the necessary adjustments to obtain national income. Table 8 gives the summary results by industrial origin.

An unusual feature of the Central Bank report is the attempt to express the 'physical volume of national income' by industrial origin in monetary terms. Whenever possible, commodities and services were valued at 1935 prices and the resulting gross value of production transformed into indexes which were linked to the estimated 'net' contribution of the industry in 1935.[7] The values for 'trade' were computed by applying the 1935 trade margins to the annual value in 1935 prices of the commodities handled. Governmental and personal services were estimated by applying indexes of employment to their estimated contribution in 1935 to the national income.

In reality, the results (Table 9) are an index of the physical production of commodities and services weighted by the contribution of each industry to the national income in 1935, expressed, however, not as an index based on 1935, but in pesos with a base equal to the national income in 1935.

What is designated 'national income' is in reality something very close to the market value of all the commodities and services produced in the country. The 'physical volume of the national income' is intended to be its counterpart in physical terms. Consequently, a simple division of one set of figures by the other should measure changes in the general price level approximately (Table 10).

The wide differences in the fluctuations of the two indexes as well as in their levels, especially in the last five years, leads one to think that the estimates may be subject to a rather wide margin of error. The difference in coverage and meaning of the indexes is not enough to explain the discrepancies, for the inclusion of services in the wholesale price index would tend to raise it even more and hence widen the margin of error. In short, it

[7] 'Net' as defined in the report, i.e., including taxes and capital consumption.

TABLE 8

Argentina

National Income by Industry, 1935–1945, Central Bank Estimate

| | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (millions of pesos) | | | | | | | | | | |
| Agriculture | 2,022 | 2,295 | 2,993 | 2,357 | 2,508 | 2,457 | 2,851 | 3,399 | 3,366 | 3,770 | 3,610 |
| Mining | 102 | 112 | 135 | 138 | 155 | 176 | 192 | 216 | 212 | 227 | 265 |
| Manufacturing | 1,251 | 1,382 | 1,512 | 1,576 | 1,693 | 1,713 | 1,987 | 2,352 | 2,700 | 3,000 | 3,200 |
| Building construction | 175 | 204 | 246 | 301 | 283 | 305 | 345 | 355 | 379 | 498 | 550 |
| Transportation, communication & public services | 884 | 925 | 934 | 955 | 998 | 981 | 1,005 | 1,127 | 1,218 | 1,296 | 1,355 |
| Trade | 1,401 | 1,630 | 1,930 | 1,915 | 1,971 | 2,051 | 2,249 | 2,515 | 2,731 | 3,100 | 3,300 |
| Finance | 143 | 146 | 166 | 175 | 192 | 195 | 214 | 230 | 252 | 260 | 277 |
| Government services | 633 | 688 | 739 | 796 | 827 | 860 | 873 | 912 | 980 | 1,109 | 1,352 |
| Personal services | 544 | 573 | 638 | 646 | 665 | 687 | 744 | 807 | 880 | 1,035 | 1,146 |
| Total | 7,155 | 7,954 | 9,293 | 8,857 | 9,294 | 9,424 | 10,458 | 11,914 | 12,718 | 14,295 | 15,055 |

TABLE 9

## Argentina

## Physical Volume of National Income in Monetary Terms, 1935–1945

### Central Bank Estimate

| | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (millions of pesos at 1935 prices) | | | | | | | | | | |
| Agriculture | 1,230 | 1,000 | 1,120 | 940 | 1,190 | 1,130 | 1,400 | 1,310 | 1,110 | 1,470 | 1,040 |
| Cattle raising | 800 | 890 | 920 | 890 | 1,000 | 970 | 1,100 | 1,200 | 1,210 | 1,130 | 1,140 |
| Agriculture, incl. mining | 2,130 | 2,010 | 2,160 | 1,970 | 2,340 | 2,270 | 2,680 | 2,700 | 2,500 | 2,790 | 2,380 |
| Mfg. & construction | 1,430 | 1,580 | 1,760 | 1,870 | 1,920 | 1,960 | 2,170 | 2,280 | 2,320 | 2,460 | 2,460 |
| Trade | 1,400 | 1,490 | 1,680 | 1,690 | 1,740 | 1,750 | 1,880 | 1,900 | 1,920 | 2,050 | 2,050 |
| Services | 2,200 | 2,340 | 2,450 | 2,540 | 2,630 | 2,630 | 2,760 | 2,850 | 2,940 | 3,000 | 3,110 |
| Total | 7,160 | 7,430 | 8,050 | 8,070 | 8,630 | 8,620 | 9,490 | 9,730 | 9,680 | 10,300 | 10,000 |

seems that either national income in current prices is understated or its 'physical volume' unduly overstated.

TABLE 10
Argentina
The Wholesale Price Index and the General Price Level Implicit in the Central Bank National Income Estimate

| | NATIONAL INCOME (millions of pesos) | | INDEXES (1935:100) | |
|---|---|---|---|---|
| | Current Prices | 1935 Prices | Implicit Price | Wholesale Price [a] |
| 1935 | 7,160 | 7,160 | 100.0 | 100.0 |
| 1936 | 7,950 | 7,430 | 107.0 | 102.3 |
| 1937 | 9,290 | 8,050 | 115.4 | 116.1 |
| 1938 | 8,860 | 8,070 | 109.8 | 108.7 |
| 1939 | 9,290 | 8,630 | 107.6 | 111.5 |
| 1940 | 9,420 | 8,620 | 109.3 | 127.1 |
| 1941 | 10,460 | 9,490 | 110.2 | 149.3 |
| 1942 | 11,910 | 9,730 | 122.4 | 143.3 |
| 1943 | 12,720 | 9,680 | 131.4 | 208.3 |
| 1944 | 14,300 | 10,300 | 138.8 | 217.7 |
| 1945 | 15,060 | 10,000 | 150.6 | 223.9 [b] |

[a] *Suplemento Estadistico,* Banco Central de la Republica Argentina.
[b] Ten months only.

## B *Bolivia*

### *Estimate prepared at the IASI, 1940*

Like Chile, Mexico, and Venezuela, Bolivia is, from a foreign trade point of view, a mining country. Tin and silver are the most important minerals but many others, such as copper, gold, bismuth, and petroleum, are also produced. Although there are no figures on total population or employment — Bolivia has not taken a census of population since 1900 — it is estimated that approximately 85 percent of the labor force are engaged in agricultural and pastoral pursuits. In 1940 the population was estimated to be 3,100,000, of whom perhaps 1,100,000 (35 percent) were in the labor force. Of these, it is known that about 12,000 were employed in manufacturing, 17,000 in government, 7,000 in railroad transportation, and 38,000 in mining. Another 50,000 were probably engaged in trade and the services. Somewhat more than 950,000 persons must therefore have been employed in agricultural and pastoral pursuits.

Information applicable to estimating national income is very sparse. From the manufacturing census taken in 1940 it appears that total wage-salary payments to the 11,577 employed per-

sons amounted to 58.4 million bolivianos.[8] Annual average wages are 5,045 bolivianos. Wages of native workers, however, were lower, no more than 3,828 bolivianos a year. Average earnings per shift in mining were only slightly higher (5 percent) than in manufacturing.[9] On this basis, total earnings for the 38,000 persons employed in mining must have averaged close to 5,250 bolivianos a year per employed person, or 200 million for the industry as a whole.[10] The average salary of the 17,000 employees working for the government was about 8,900 bolivianos a year.[11]

Data on agricultural production were apparently confined to cattle consumption, although corn, potatoes, cassava, peanuts, wheat, barley, cotton, rubber, and a wide variety of fruits and lumber are produced in large quantities, mostly for internal consumption. It seems, however, that living conditions in agriculture do not differ in any considerable degree from those of native workers employed in mining or manufacturing. Income in agriculture was estimated to be 3,500–4,000 bolivianos a year per employed person. Labor income in 1940, exclusive of the service occupations, amounted to 3,961.4 million bolivianos.

| | EMPLOYMENT (thousands) | EARNINGS (bolivianos) | TOTAL LABOR INCOME (millions of bolivianos) |
|---|---|---|---|
| Agriculture | 950.0 | 3,750 | 3,550.0 |
| Mining | 38.0 | 5,250 | 200.0 |
| Manufacturing | 11.6 | 5,045 | 58.4 |
| Government | 17.2 | 8,900 | 153.0 |
| Total | 1,016.8 | | 3,961.4 |

The income of approximately 50,000 workers in service occupations (trade, the professions, etc.) should be added to the four groups in the tabulation. Their average income must have been similar to that of government employees, yielding a total of some 445 million bolivianos. Total labor income, therefore, seems close to 4,400 million bolivianos. Assuming that labor income constitutes 60 percent of the total — as it does in Venezuela and Chile — the national income of Bolivia in 1940 should have been close to 7,350 million bolivianos.

[8] One boliviano in 1940 was worth 0.0254 American dollars.

[9] Gabin Price, 'Labor Income in Bolivia', *Estadistica*, No. 10, June 1945.

[10] *Transportes 1940*, *Balances Mineros 1939* (Ministerio de Hacienda, Direccion General de Estadistica).

[11] *Finanzas* (Ministerio de Hacienda, Direccion General de Estadistica, 1940).

## C *Brazil*

### (1) *Estimate of Bento Miranda, 1926* [12]

Sr. Bento Miranda followed two approaches in estimating the national income of Brazil. The first consisted of computing it as a percentage of aggregate wealth (Table 11); the second, of adopting a formula suggested by Sir Josiah Stamp, although important deviations were made. The basic figures are for 1919 — Census of 1920 — and were adjusted for changes in the value of money between 1918 and 1925.

TABLE 11

Brazil

National Income as a Percentage of Total Wealth, 1926

Bento Miranda's Estimate

| | MILLIONS OF CRUZEIROS |
|---|---|
| Value of cultivated land, improvements, equipment, livestock, industrial machinery, buildings, movable property, harbors and railroads, mines & forest products | 38,055 |
| *Plus* | |
| 70% to account for depreciation of currency between 1918 and 1925 | 26,639 |
| Total | 64,694 |
| Total rounded-off | 60,000 |
| Net income (15% of 'Total rounded-off') | 9,000 |

With the second approach Bento Miranda tried to compute national income on the basis of the flow of commodities at retail prices. In doing this, however, capital formation is almost completely omitted; only some services are included (Table 12).

TABLE 12

Brazil

National Income, 1926: Sir Josiah Stamp's Method

Bento Miranda's Estimate

| | MILLIONS OF CRUZEIROS |
|---|---|
| Retail value of agricultural, manufacturing, mining & extractive production | 7,892.0 |
| Consumption taxes on home production | 131.2 |
| Imports of consumption goods | 993.2 |
| Livestock | 10.7 |
| Manufactures | 659.8 |
| Foodstuffs | 322.7 |
| Taxes, transportation costs, & distribution costs of imports (40% of Imports) | 397.3 |
| Total | 9,413.6 |

[12] *Discursos Parlamentares — Riqueza, Renda e Capacidade Tributaria, Edicão de 1926*, quoted by Osvaldo Gomes da Costa Miranda in 'A Estimativa da Renda Geral do Brasil', *Boletim do Ministério do Trabalho, Indústria e Comércio*, June 1944, pp. 209–12.

TABLE 12 (*Continued*)

| | |
|---|---|
| *Minus* | |
| Value of exports | 2,178.7 |
| Balance | 7,234.9 |
| Depreciation on equipment & stocks (20% of 'Balance') | 1,446.9 |
| Total national income at 1919 prices | 5,788.0 |
| Depreciation of the currency, 1918–25 | 4,051.5 |
| Total national income at current prices | 9,839.5 |

### (2) *Estimate of Osvaldo Gomes da Costa Miranda, 1927* [13]

Bento Miranda's estimate was brought up to date by Osvaldo Gomes da Costa Miranda, using production figures published by the Agricultural Control and Promotion Service (Servicio de Inspecao e Fomento Agricolas) and more recent estimates of the value of industrial production. He thus avoids the rough adjustment Bento Miranda made to account for changes in the value of money. In general, however, the estimate follows lines similar to those of the preceding report, and the results are only slightly higher (Table 13).

TABLE 13
Brazil
National Income, 1927
Osvaldo Gomes da Costa Miranda's Estimate

| | MILLIONS OF CRUZEIROS |
|---|---|
| Gross value of agricultural, manufacturing, mining & extractive industries, at retail prices | 12,600.0 |
| Consumption taxes on home production | 236.0 |
| Imports of consumption goods | 2,170.0 * |
| Livestock | 5.7 |
| Manufactures | 1,503.9 |
| Foodstuffs | 657.2 |
| Taxes, transportation costs, & distributive costs of imports (40% of Imports) | 864.0 |
| Total | 15,870.0 |
| *Minus* | |
| Value of exports | 3,190.0 |
| Balance | 12,680.0 |
| Depreciation on equipment and stocks (20% of 'Balance') | 2,536.0 |
| Net national income | 10,144.0 |

* There is a small arithmetic error.

[13] *Boletim do Ministério do Trabalho, Indústria e Comércio*, Dec. 1944, pp. 212–5.

### (3) *Estimates of Messrs. Bulhoes, Simonsen, and the Bank of Brazil, 1930–41*

Economic statistics cover only a fraction of the total productive activities of Brazil. Nevertheless, several attempts have recently been made to estimate the national income. The results vary considerably, ranging from 34.8 million to 74.6 million contos for 1941.[14] Unfortunately, it is not known how the calculations were made, but in view of the limitations of the Brazilian data, it is likely that all were heavily influenced by purely personal judgments. The estimate by Octavio Bulhoes gives 28.7 million contos for 1940, 34.8 million contos for 1941, and 41.4 million contos for 1942.[15] Mr. Simonsen, in an address before the Chamber of Commerce of São Paulo (June 13, 1944) stated that the national income of Brazil was 40.0 million contos. The estimates by the Bank of Brazil, Statistical and Economic Studies Section, for 1930–39 are considerably higher than any other. The method is not explained, and they may include a large share of imputed income. On the whole, they seem to overestimate the national income of Brazil. (Since 1939 the figures have been compiled by the Commission of Economic Defense.[16])

MILLIONS OF CONTOS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1930* | 24.0 | *1932* | 21.0 | *1934* | 27.0 | *1936* | 36.0 | *1938* | 44.0 | *1940* | 61.6 |
| *1931* | 20.0 | *1933* | 25.0 | *1935* | 32.0 | *1937* | 42.0 | *1939* | 55.0 | *1941* | 74.6 |

A new valuation of Brazilian national income for 1940 is included in the group of Latin American estimates prepared at the Inter American Statistical Institute. The Brazilian Institute of Geography and Statistics, in cooperation with the Ministry of Finance, is at present engaged in preparing a new estimate which will undoubtedly be the most complete and reliable ever made in Brazil. It will have the great advantage of utilizing accurate data from the 1940 Census. Teixeira de Freitas, President of the Inter American Statistical Institute, is lending his full support to the project.

[14] One conto equals 1,000 cruzeiros, 1,000,000 milreis, or approximately 50 United States dollars.

[15] Quoted by Luiz Dodsworth Martins in 'Notas sobre o Calculo da Renda Nacional' (typewritten preliminary manuscript).

[16] *South American Journal*, July 25, 1942.

## D *Chile*

Current statistical information in Chile covers a wider range of subjects and at the same time is perhaps more centralized than in any other Latin American country. In addition, Chile can boast an excellent record in the matter of population and other censuses, all of which helps to explain the number of national income estimates and the relatively small differences among them.

As mentioned in the Introduction, the estimates of Ing. Simón are among the pioneer studies of this kind in Latin America. Despite their imperfections, they deserve a place in the history of these studies and consequently are described in detail in the following pages. The several new estimates of recent years are also commented upon as far as possible. The latest contribution is a study prepared under the supervision of Flavian Levine of the Corporación de Fomento de la Producción de Chile (Chilean Development Corporation), to be published under its auspices in the near future. The figures and all the basic material have been made available to the author and the relevant parts also appear below.

As this study covers 1940–43, it overlaps in three years a similar estimate prepared at the IASI for 1935–42. Since the IASI estimate is merely provisional and was prepared in Washington with the material that could be found there, preference should be given to the new estimate compiled in Chile, i.e., at the sources of data. The differences do not seem too large to warrant disregard of the IASI estimate, which will probably be improved and linked with the estimate of the Corporación de Fomento in the near future.

### (1) *Estimate of Raúl Simón, 1929–1941* [17]

Ing. Simón calculated Chile's national income for 1929–34 in five ways: as the yield of the national capital; the value of mechanical work; the value of goods and services; the aggregate of wages, salaries, and the yield of capital; and as the aggregate value of sales. After 1934 the second approach alone was used.

[17] *Determinación de la Entrada Nacional* (national income) *de Chile* (Imprenta Nacimiento, Santiago, 1935). Also *Anales del Instituto de Ingenieros de Chile*, Jan. 1935, Jan. 1938, and July–August 1940.

An index (1934:100) of the estimated KWH potential of the country was prepared and linked with the national income for 1934, the average of the five methods. By means of price indexes the resulting figures were converted into estimates in current prices.

(a) YIELD OF THE NATIONAL CAPITAL. These estimates are based upon the assumption that national income constitutes a fixed 15 percent of the aggregate value of the national capital or national wealth. The respective tables — prepared only for 1930 and 1934 — are summarized in Table 14.

(b) EVALUATION OF MECHANICAL WORK.[18] The second approach (evaluation of mechanical work), an original one devised by Simón, is based on the conversion of coal production, imports of oil (petroleum), imports of gasoline, human and animal energy, hydro-electric energy, and the equivalent in coal of other sources of energy into kilowatt-hours.[19]

TABLE 14
Chile
National Wealth and Income, 1930 and 1934
Rául Simón's Estimate

| | *1930* | *1934* |
|---|---|---|
| | (millions of pesos) | |
| Value of real estate | 17,240 | 19,840 |
| Value of livestock inventories | 770 | 770 |
| Agricultural equipment | 610 | 730 |
| Household equipment | 1,110 | 1,670 |
| Industrial equipment | 1,200 | 1,400 |
| Transportation equipment | 1,827 | 2,400 |
| Merchant marine | 80 | 104 |
| Harbors & public works | 1,330 | 1,330 |
| Telegraph & telephone | 90 | 100 |
| Electricity (plant & distribution lines) | 850 | 1,100 |
| Mining equipment | | |
| Nitrate industry (nationalized capital) | 3,000 | 1,880 |
| Copper industry (nationalized capital) | 1,900 | 2,500 |
| Coal and other | 150 | 226 |

[18] *Determinacion de la Entrada Nacional de Chile*, pp. 50–4, and *Anales del Instituto de Ingenieros de Chile*, July–August 1940.

[19] Neither hydro-electric energy nor 'other sources of energy' appear in the estimates before 1938. The quantities of 'other sources of energy' are assumed to be constant throughout the period, thus introducing a factor that tends to smooth the fluctuations in coal, oil, gasoline, animal and human work, and hydro-electricity. 'Other' constitutes about 15 percent of the total.

TABLE 14 (*Continued*)

| | | |
|---|---|---|
| Stocks | | |
| Monetary gold | | 710 |
| Products for home consumption | | 500 |
| Exportable products | | 90 |
| Imported products | | 60 |
| Total national capital | 31,447 | 36,336 |
| Total national income (15% of total national capital) | 4,720 | 5,460 |

The factors used to convert the above sources of energy into KWH are the following:

| | KWH |
|---|---|
| 0.7 kgs. of coal | 1 |
| 0.5 kgs. of oil | 1 |
| 0.4 kgs. of gasoline | 1 |
| 1 man-year of work | 300 |
| 1 animal-year of work | 1200 |

The kilowatt-hours obtained by multiplying by the respective coefficient the quantities of coal, oil, etc. produced are evaluated by using the price of electricity for home consumption (0.81 centavos in 1929). The idea of evaluating the quantity of KWH produced in terms of the price of electricity was apparently inspired by the observation that the relation between national income for the United States in 1930 ($70.3 billion) and the equivalent in KWH of the different kinds of energy produced happened to be very similar to the price of electricity for home consumption. Ing. Simón points out that "this relationship represents, in fact, something more than a simple statistical coincidence since it precisely establishes the price at which, under free competition, a consumer of electricity exchanges the value of his own human work for the mechanical work provided by an electric current carried to his own home".[20] Since the price of electricity in Chile after 1930 was apparently not fixed by free competition, it was approximated by using the cost of living index based on 1930.

After 1934 Simón continued to prepare estimates of the Chilean KWH potential and relate them to the 1934 'national income' derived as an average of the estimates calculated by the five methods mentioned above. The resulting figures were converted to current price levels, using the index of wholesale prices (Tables 15 and 16).

[20] *Determinación de la Entrada Nacional de Chile*, p. 21.

TABLE 15

Chile

KWH Equivalent of Different Sources of Energy and National Income, 1929–1941

Raúl Simón's Estimate

| | COAL | OIL | GASO-LINE | ANIMAL WORK | HYDRO-ELEC-TRICITY | OTHER | TOTAL | NATIONAL INCOME (millions of pesos) |
|---|---|---|---|---|---|---|---|---|
| | (millions of KWH) | | | | | | | |
| 1929 | 2,160 | 1,980 | 320 | 1,440 | 212 | 1,070 | 7,182 | 4,770 |
| 1930 | 2,060 | 1,730 | 320 | 1,450 | 230 | 1,070 | 6,860 | 4,500 |
| 1931 | 1,570 | 904 | 318 | 1,460 | 240 | 1,070 | 5,562 | 3,290 |
| 1932 | 1,540 | 360 | 145 | 1,470 | 220 | 1,070 | 4,805 | 3,000 |
| 1933 | 2,200 | 424 | 178 | 1,495 | 270 | 1,070 | 5,637 | 4,500 |
| 1934 | 2,570 | 704 | 170 | 1,510 | 320 | 1,070 | 6,344 | 5,270 |
| 1935 | 2,720 | 760 | 248 | 1,540 | 350 | 1,070 | 6,688 | |
| 1936 | 2,670 | 764 | 220 | 1,580 | 380 | 1,070 | 6,699 | |
| 1937 | 2,830 | 1,342 | 250 | 1,610 | 420 | 1,070 | 7,460 | |
| 1938 | 2,920 | 1,228 | 330 | 1,640 | 600 | 1,070 | 7,788 | |
| 1939 | 2,680 | 1,062 | 320 | 1,670 | 693 | 1,070 | 7,495 | |
| 1940 | | | | | | | 8,194 | |
| 1941 | | | | | | | 9,000 | |

TABLE 16

Chile

National Income in KWH and Pesos, 1934–1941

Raúl Simón's Estimate

| | *1934* | *1935* | *1936* | *1937* | *1938* | *1939* | *1940* | *1941* |
|---|---|---|---|---|---|---|---|---|
| KWH (millions) | 6,344 | 6,688 | 6,699 | 7,460 | 7,778 | 7,495 | 8,194 | 9,000 |
| Wholesale price index (1934 : 100) | 100 | 100 | 110 | 132 | 125 | 123 | 135 | 151 |
| National income (millions of pesos) | 5,256 * | 5,550 | 6,125 | 8,225 | 8,089 | 7,645 | 9,150 | 11,220 |

* Average of 5 methods.

(c) VALUE OF GOODS AND SERVICES.[21] The value of goods and services is the sum of the value of agricultural production, the value of mineral production, the value contributed by manufacturing, freight, passenger, and mail transportation, the mobilization of capital (finance), government, retail and wholesale trade, and miscellaneous (Table 17). Simón's method of estimating each of these nine items is explained briefly.

A basic estimate of the *value of agricultural production* and certain cost deductions was prepared for 1934. The quantities produced were evaluated by applying wholesale prices in Santiago or at the point of exportation. From these values, railroad

[21] *Ibid.*, pp. 54–71.

transportation costs, commissions, and sales expenses were deducted. The estimate was completed by adding the value of commodities consumed at the site of production. The estimate for years other than 1934 was based upon an index of agricultural prices on the assumption that the quantities produced remained constant throughout the period.

Only the value of the production of nitrates, copper, coal, and gold was included in the *value of mineral production*. It was assumed that the exclusion of other minerals would compensate for duplications due to the inclusion of the total value of production — as in the case of the four minerals mentioned above instead of income items alone. Profits of the nitrate and copper industries were excluded since they are earmarked for payments on the national debt abroad.

The estimate of the *value contributed by manufacturing* attempts to cover wages and salaries paid, dividends, depreciation on machinery, and interest on capital (bank and mortgage loans). Wages and salaries were based on 1930 industrial employment figures and a series of average wage-salary payments. Dividends, depreciation on machinery, and interest on capital were estimated *in toto* to be 10 percent of the capital invested in the industry. This last concept involves an addition to the corporate capital of 30 percent for loans to the industry and 20 percent for 'non-corporate' enterprises.

Estimates for other years are calculated by applying to wage-salary payments an index of the 'physical volume of production', in other words, wage-salary payments are assumed to fluctuate with production, but changes in average wage-salaries are disregarded. The second group of items is made to fluctuate with an index of sales of industrial products.

The contribution of *freight transportation* is estimated by applying average rates for the tonnage transported by railroad, the merchant marine, and trucks. While no deductions are made for costs, which do not constitute income for the sector, the approximate nature of the estimate perhaps renders this omission of little significance. A similar procedure is adopted for *passenger transportation*. *Mail transportation* is valued at 65–80 million Chilean pesos. No other information is given.

TABLE 17

Chile

National Income as the Sum of Commodities and Services, 1929–1934

Raúl Simón's Estimate

| | *1929* | *1930* | *1931* | *1932* | *1933* | *1934* |
|---|---|---|---|---|---|---|
| | (millions of pesos) | | | | | |
| Agricultural production | 1,860 | 1,520 | 1,220 | 1,750 | 2,300 | 2,220 * |
| Mineral production | 866 | 639 | 423 | 310 | 429 | 720 |
| Value added by manufacturing | 991 | 993 | 813 | 879 | 953 | 1,075 |
| A Value of production | 3,717 | 3,132 | 2,456 | 2,939 | 3,682 | 4,015 |
| Freight transportation | 625 | 590 | 454 | 342 | 403 | 464 |
| Passenger transportation | 289 | 289 | 276 | 276 | 295 | 301 |
| Mail transportation | 80 | 80 | 70 | 65 | 80 | 80 |
| Mobilization of capital | 229 | 229 | 229 | 229 | 229 | 229 |
| Government services | 682 | 703 | 641 | 558 | 630 | 715 |
| Wholesale trade | 500 | 441 | 364 | 326 | 456 | 518 |
| Retail trade | 700 | 640 | 510 | 456 | 640 | 724 |
| Miscellaneous | 150 | 150 | 125 | 125 | 175 | 200 |
| B Value of services | 3,255 | 3,122 | 2,669 | 2,377 | 2,908 | 3,231 |
| Total (A + B) | 6,972 | 5,578 | 5,125 | 5,316 | 6,590 | 7,246 |
| *Minus* | | | | | | |
| 29% duplication | 2,020 | 1,680 | 1,485 | 1,540 | 1,910 | 2,080 |
| National income | 4,952 | 3,898 | 3,640 | 3,776 | 4,680 | 5,166 |

*Determinación de la Entrada Nacional de Chile*, p. 71.

* Includes 420 million pesos consumed on the site of production.

*Services for the mobilization of capital* include banks and other credit institutions, as well as commercial and social insurance. The contribution of such firms is assumed to be given by their 'administrative expenses', estimated in various ways.

*Government services* are represented by all types of payment to persons working for the government, both federal and municipal.

It is assumed that the contribution of *retail and wholesale trade* constitutes a constant 10 percent of estimated wholesale sales and 20 percent of retail. Sales are obviously only approximate, equivalent to the value of agricultural, mineral, and manufacturing production, plus imports. These items are considered to give the value of wholesale trade. Retail sales are estimated to be 70 percent of wholesale.

*The miscellaneous* group is made up of several services not included above, such as domestic, professional, religious, which are valued at 150 million Chilean pesos, including 50 million to cover payments in kind to domestic workers.

The final step, called the *adjustment for duplications*, consists of subtracting 29 percent from the figures estimated for each group mentioned above. This adjustment is justified on the following grounds. Of 1,337,000 persons gainfully occupied, 391,000 (29 percent) are engaged in the production of all types of service. "The salaries obtained as a result of these services are used, in their final stage, in the purchase of commodities, so that by creating an additional demand, they tend to raise the price of commodities. . . . Theoretically and actually, products and services are equivalent, since the creation of both assumes personal work and (on this basis) units of *work* could be added without duplications. But the conversion of commodities and services into monetary units implies the influence of one upon the other, a factor which does not permit their addition without a duplication, the importance of which is proportional to their accumulated value." Consequently, this deduction "is equivalent to admitting that if there were no people engaged in the production of services, prices, or the value of production plus that of services, would be reduced by 29 percent".[22]

(d) AGGREGATE OF WAGES AND SALARIES PAID PLUS THE YIELD OF CAPITAL. This estimate covers only wages and salaries and the 'yield of capital', including interest on capital invested in agriculture and trade, plus profits of corporate enterprises (Table 18). Wages in agriculture are computed as the product of employment and an average income of 2,400 Chilean pesos a year, the latter assumed constant throughout the period. Wages and salaries in other economic sectors (mining, manufacturing, trade, communications and shipping, public administration and national defense, the professions, domestic services, etc.) are approximated by similar methods. In general, the several estimates are based upon employment and average income obtained from different sources or calculated in various ways. In some cases the figures are actual estimates for each year; in others, e.g., manufacturing, the hypothesis that wages and salaries vary in proportion to production is adopted.

Interest payments on capital invested in agriculture are derived by subtracting from the gross value of production the cost of seed and other expenses (15 percent of the value of produc-

[22] *Ibid.*, p. 70.

TABLE 18
Chile
National Income as the Sum of Income from Labor and the Yield of Capital, 1929–1934
Raúl Simón's Estimate

| | *1929* | *1930* | *1931* | *1932* | *1933* | *1934* |
|---|---|---|---|---|---|---|
| | (millions of pesos) | | | | | |
| Agriculture | 1,373 | 1,123 | 915 | 1,313 | 1,373 | 1,373 |
| Mining | 467 | 370 | 208 | 178 | 238 | 273 |
| Industry | 843 | 843 | 625 | 735 | 800 | 875 |
| Commerce | 750 | 660 | 545 | 490 | 682 | 770 |
| Transportation | 274 | 304 | 264 | 260 | 331 | 335 |
| Government | 682 | 703 | 641 | 558 | 630 | 715 |
| Professions | 275 | 275 | 250 | 260 | 270 | 280 |
| Domestic service | 50 | 50 | 40 | 45 | 50 | 55 |
| Miscellaneous | 160 | 160 | 140 | 150 | 150 | 170 |
| Total wages & salaries | 4,874 | 4,488 | 3,628 | 3,989 | 4,524 | 4,846 |
| Contribution to social insurance | 85 | 194 | 62 | 60 | 68 | 77 |
| Total labor income | 4,959 | 4,682 | 3,690 | 4,049 | 5,592 | 4,923 |
| Agricultural income from capital | 21 | 0 | 0 | 0 | 351 | 293 |
| Corporate profits | 186 | 172 | 58 | 64 | 122 | 167 |
| Total income from capital | 207 | 172 | 58 | 64 | 473 | 460 |
| Total national income | 5,166 | 4,854 | 3,748 | 4,113 | 5,065 | 5,383 |

*Determinación de la Entrada Nacional de Chile*, p. 91.

tion); wages in cash and kind; salaries paid agricultural employees (in cash only); fertilizer, depreciation, taxes, social laws, etc. (10 percent of the value of production); and entrepreneurial income.

In 1929 the residual for 'interest payments' was 21 million Chilean pesos. As the 1930, 1931, and 1932 balances were negative, no charge is made on this account. In 1933 and 1934 the balances were again positive.

Data on corporate profits were taken from official sources, while interest on capital invested in trade was estimated as a fixed 7 percent charge. This capital is assumed to equal three months' sales.

(e) AGGREGATE VALUE OF SALES. In this estimate Ing. Simón assumes that national income is equal to wholesale sales plus distributive costs in retail trade. Sales are estimated by adding (a) the value of agricultural production at wholesale prices in Santiago or at the point of exportation (the basic estimate is for 1934; other years are estimated by assuming constant physical production and changes only in prices); (b) the value of

mineral production at the mine; (c) the value of manufacturing sales (Table 19). How (c) is derived is not known, but there

TABLE 19
Chile
National Income as the Sum of Sales, 1929–1934
Raúl Simón's Estimate

| | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 |
|---|---|---|---|---|---|---|
| | (millions of pesos) | | | | | |
| Agricultural | 1,630 | 1,320 | 1,080 | 1,530 | 2,100 | 1,932 |
| Mineral | 866 | 639 | 423 | 310 | 429 | 720 |
| Manufacturing | 1,300 | 1,310 | 1,065 | 1,080 | 1,150 | 1,500 |
| Total * | 3,796 | 3,269 | 3,148 | 2,820 | 3,679 | 4,172 |
| *Plus* | | | | | | |
| Cost of retail distribution (20% of 70%) | 760 | 654 | 630 | 565 | 735 | 830 |
| National income | 4,556 | 3,923 | 3,778 | 3,385 | 4,414 | 5,002 |

*Determinación de la Entrada Nacional de Chile*, p. 93.

* There are several mistakes in the arithmetic operations. If corrected, 'national income' would be considerably altered.

seems to be an error in it since the value contributed by manufacturing, as calculated by the third method (see Table 17), is too low in comparison with the value of sales. A constant 20 percent charge is made on 70 percent of the value of wholesale trade (assuming that retail trade is 70 percent of wholesale).

COMMENTS ON SIMÓN'S ESTIMATES. Despite the wide differences in the methods followed by Simón in preparing his estimates, all five and their movements throughout the period are similar (Table 20).

TABLE 20
Chile
National Income, 1929–1934
Raúl Simón's Five Estimates

| Method | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 |
|---|---|---|---|---|---|---|
| | (millions of pesos) | | | | | |
| 1 | | 4,720 | | | | 5,460 |
| 2 | 4,770 | 4,500 | 3,290 | 3,000 | 4,500 | 5,270 |
| 3 | 4,952 | 3,898 | 3,640 | 3,776 | 4,680 | 5,166 |
| 4 | 5,166 | 4,854 | 3,748 | 4,113 | 5,065 | 5,383 |
| 5 | 4,556 | 3,928 | 3,778 | 3,385 | 4,415 | 5,002 |
| Average | 4,861 | 4,380 | 3,614 | 3,568 | 4,665 | 5,256 |

The first approach (yield of the national capital) obviously cannot be utilized as a check on the others since the selection of a 15 percent rate of return is purely arbitrary, and errors are inherent in the evaluation of the national capital.

The second approach (evaluation of mechanical work) in reality gives the country's KWH potential converted into money values by a dubious procedure. The similarity of these estimates to those obtained by other methods cannot but be accidental. Since for 1930–34 the price per KWH of electricity is made to fluctuate with the cost of living index and in succeeding years with the wholesale price index, the national income figures in their final form reflect — with many qualifications — the potential productive capacity of the nation plus some price changes. As it is, this method can no more be used to check the others than the first.

The third method (value of goods and services) more nearly resembles those used in other countries. The results, before the adjustment for duplications, seem to give the most accurate picture of the national income of Chile. The adjustment in the value of goods and services yields an estimate that shows only the net value of goods and a fraction of services. The income flowing to those engaged in the various service activities is about one-half of total income, so that in cutting the latter by 29 percent, only a part of the value of services is accounted for.

Theoretically, the fourth method (aggregate wages and salaries paid plus the yield of capital) should not yield results too dissimilar to those obtained by the third. It covers labor income and interest on capital, which normally constitute a high proportion of national income. The estimate, however, is faulty in that the figures for agriculture, assumed constant for the period, introduce an error that must be considerable. As rents and other income items are excluded, it is not surprising that this estimate is smaller than those obtained by the third method (before the adjustment).

The fifth method (value of sales) can at best yield only approximations since the estimates of sales are very rough. Moreover, capital formation and services not embodied in commodities, including governmental services to private individuals, are omitted.

### (2) *Estimates of Guillermo del Pedregal and J. N. Cifuentes, 1940–41 and 1942* [23]

The estimates of Pedregal and Cifuentes are very similar in method and sources of information (Table 21). Both are based

TABLE 21

Chile

National Income, 1940–41 and 1942

| Source of Income | Pedregal 1940–41 [a] | Pedregal 1942 | Cifuentes 1942 |
|---|---|---|---|
| | (millions of pesos) | | |
| Real property | 1,435.4 | 3,817.5 | 2,332.7 |
| Movable capital | 449.7 | 796.1 | 1,276.5 |
| Industry and commerce | 1,960.6 | 3,900.0 | 2,370.9 |
| Mining and metallurgy | 1,512.6 | 1,175.8 | 1,599.6 |
| Wages, salaries, and pensions | 4,757.3 | 7,900.0 | 7,709.3 |
| Professions | 77.0 | 170.0 | 172.5 |
| Non-recorded income [b] | 1,019.3 | 1,775.9 | . . |
| Total national income | 11,211.9 | 19,535.3 | 15,461.5 |

[a] The estimate for 1942 contains some references to the 1941 estimate that seem to indicate that the transcribed figures have been revised. P. T. Ellsworth (*Chile, an Economy in Transition;* Macmillan, 1945) has made several minor adjustments in the 1940–41 estimate which yield a national income of 12.1 billion pesos.

[b] Represents 10 percent of the recorded income.

mainly on income tax data, information from the various social security agencies, and with respect to income from real property, on official real estate valuations, adjusted to represent actual values more closely. The estimates for 1942 differ somewhat, partly because Cifuentes does not include an estimate of the income that eludes income tax and other controls. Another source of discrepancy is in the adjustments made in official figures and in the computation of total income for groups for which only the income tax actually paid is known.

### (3) *Estimates of Flavian Levine* [24]

In preparing these estimates Mr. Levine and the group under his direction utilized to the fullest extent all the available ma-

[23] Guillermo del Pedregal presented his estimate while in charge of the Ministry of Finance and on the occasion of hearings in support of the economic bill before the Chilean Chamber of Deputies (Representatives). Both estimates were made available by Herman Max of the Central Bank of Chile.

[24] *Renta Nacional, 1940–45* (Santiago de Chile, 1946). The study was prepared under the auspices of the Corporación de Fomento de la Producción de Chile by a group supervised by Mr. Levine. The Seminar of Econometrics, University of Chile, School of Economics, also cooperated.

terial. In addition, for sectors for which data were scarce or their validity or accuracy doubtful, they undertook special enquiries. Consequently, the supporting material is very extensive although for our purposes we can summarize the results in a few tables. Having reviewed and checked the material with that used at the IASI, we are in a better position to advance some judgment concerning the final results (Table 22).

TABLE 22
Chile
National Income, 1940–1943
Corporación de Fomento Chileno Estimate

| | 1940 | 1941 | 1942 | 1943 |
|---|---|---|---|---|
| | (millions of pesos) | | | |
| 1 Agriculture & fishing | 2,923 | 3,299 | 4,136 | 4,745 |
| 2 Mining | 1,702 | 1,927 | 2,247 | 2,910 |
| 3 Manufacturing | 2,903 | 3,707 | 5,020 | 5,882 |
| 4 Building construction | 332 | 405 | 440 | 584 |
| 5 Transportation | 891 | 1,284 | 1,523 | 1,692 |
| 6 Public services | 163 | 216 | 377 | 408 |
| a Post office, telegraph, telephone & radio | 86 | 101 | 178 | 188 |
| b Gas, electricity, & water works | 77 | 115 | 199 | 220 |
| 7 Trade | 2,324 | 2,419 | 3,145 | 4,034 |
| 8 Financial services | 788 | 800 | 1,042 | 1,175 |
| a Banking & insurance | 511 | 420 | 504 | 586 |
| b Other | 277 | 380 | 538 | 589 |
| 9 Other services | 1,701 | 2,127 | 2,468 | 2,775 |
| a Services rendered the public * | 742 | 922 | 1,155 | 1,268 |
| b Liberal professions | 233 | 258 | 335 | 436 |
| c Teaching | 306 | 451 | 455 | 496 |
| d Domestic services | 296 | 339 | 345 | 376 |
| e Miscellaneous | 125 | 158 | 177 | 198 |
| 10 Investments | 1,818 | 1,974 | 2,154 | 2,442 |
| a Urban real estate | 1,543 | 1,689 | 1,838 | 2,033 |
| b Rural real estate | 65 | 71 | 77 | 78 |
| c Interest on internal government debt | 111 | 110 | 120 | 154 |
| d Interest on land mortgages | 99 | 105 | 119 | 178 |
| 11 Government (labor payments) | 1,268 | 1,630 | 1,856 | 2,684 |
| 12 Miscellaneous | 150 | 200 | 270 | 320 |
| 13 Total | 16,963 | 19,987 | 24,678 | 29,650 |

*Includes hotels, restaurants, beauty parlors, theaters, race tracks, real estate dealers, information and tourist bureaus, etc.

National income is defined as 'the gross value of production after deduction of costs of operation'; the latter constitute payments to other industries. Agriculture, mining, and manufacturing were estimated in accordance with the definition given above; for most other industries, the direct payments approach

was used. Even for agriculture, mining, and manufacturing the direct approach as well as the indirect was used.

The classification cannot properly be called by industrial origin since among the 'industries' there is a group called 'Rents' which gives not only rents on urban and rural real estate but also interest on land mortgages and on the internal public debt.

Governmental services are apparently valued at cost but the figure appearing under 'Government' covers only labor payments. Interest payments, as indicated, are shown as originating in 'Rents'.

The distribution by income shares is incomplete (Table 23). In every case wages, salaries (including social security payments), and entrepreneurial income were properly segregated. Profits, nevertheless, are given for only three industries (public services, trade, and financial services), while interest and rents do not appear in any industry, although the basic material shows that for some the information was available. As indicated, net income in agriculture, mining, and manufacturing was computed by subtracting payments to other industries from the gross value of production. The difference between the resulting 'net value' — contribution of the industry to national income — and the sums estimated independently as corresponding to wages, salaries, and entrepreneurial income is lumped into an item called 'surplus'. By definition this surplus must be made up of profits, interest, rents, royalties, and other income items. Consequently, it seems that 'rent' involves a pure duplication so far as it includes rural rent (computed in agriculture), interest on land mortgages (computed anywhere else), and even in part urban rents in the amount that they cover non-residential rents. Rents in manufacturing and trade alone are estimated to be approximately 200 million pesos.

The definition of net income originating in mining departs from the above inasmuch as taxes paid by foreign companies are made to appear as an income share of the industry. The procedure, although implying a change in definition can be defended, since the large taxes paid by foreign companies cannot be said to represent in any way the counterpart of services rendered by the government, as is implicitly assumed to be the case for other industries.

## Table 23
## Chile
## National Income by Industry and Type, 1942
## Corporación de Fomento Chileno Estimate

| | Total | Wages | Salaries | Social Security Payments | Entrep. Income | Profits | Interest | Rents | Surplus [a] |
|---|---|---|---|---|---|---|---|---|---|
| | (millions of pesos) | | | | | | | | |
| Agriculture | 4,072 | 1,011 | 220 | 30 | 1,529 | | | | 1,283 |
| Fishing | 64 | b | b | b | b | b | b | b | b |
| Mining | 2,247 | 677 | 303 | 79 | 120 | | | | 1,069c |
| Manufacturing | 5,020 | 1,455 | 444 | 168 | 1,481 | | | | 1,472 |
| Building construction | 440 | 286 | | 14 | 140 | | | | |
| Transportation | 1,523 | 772 | 606 | 21 | | | | | 125 |
| Public services | 377 | 323 | d | d | | 53 | | | |
| Trade | 3,145 | 172 | 672 | 84 | 1,900 | 317 | | | |
| Financial services | 1,042 | 699 | d | d | | 343 | | | |
| Other services | 2,468 | 572 | 676 | | 1,042 | | | | 178 |
| Investments | 2,154 | | | | | | 239 | 1,915 | |
| Government | 1,856 | 1,856 | d | | | | | | |
| Miscellaneous | 270 | b | b | b | b | b | b | b | b |
| Total | 24,678 | | | | | | | | |

[a] The composition of this item in the distribution by shares is not given. The item arises because net income in most industries was estimated by subtracting payments to other industries from the gross value of the production of the one considered, while the distributive shares were computed independently.

[b] No distribution by shares is given.

[c] Includes 909 million pesos of taxes paid by foreign mining companies.

[d] Included with wages.

### (4) *Estimates prepared at the IASI*

This set of estimates was prepared by the author in Washington chiefly from information available there, which was incomplete. Even so, national income — after the necessary adjustments for differences in definition and minor arithmetical errors — does not differ by more than 10 percent from the total obtained by Mr. Levine in his more recent study.[25] Since the estimates prepared at the IASI go back to 1936 they are presented with the qualification that they are provisional and subject to correction.

To facilitate comparison of the two estimates, 1942 is selected. The difference in the totals is 5,047 million pesos, or a little over 20 percent of Mr. Levine's estimate. Of this difference 400 million is due to the duplication involved in 'rents' already mentioned. Another 900 million is explained by the inclusion of taxes paid by foreign mining companies, an item not included in our estimate. A further 200 million is accounted for by governmental savings, because in our estimate governmental services were valued at market prices while Mr. Levine used the cost method.

The above differences are due exclusively to divergences in concept. In matters of actual computation it is our impression that at least one industry, urban real estate, was overestimated in Mr. Levine's study. His estimate for 1942, 1,838 million pesos, is nearly 8 percent of national income. Since rents in agriculture — on the basis of reported values of urban and rural land — must amount to a similar figure, the percentage that rent constitutes of national income is obviously too high to be accepted at face value. Part of the explanation lies in the fact that Mr. Levine raised the official real estate valuations according to verbal information from real estate dealers. The figures of the Dirección General de Estadística (National Bureau of Statistics) show that actual sales were nearer the official valuations. The error on this account is at least 900 million pesos. This impression is corroborated by the estimates of del Pedregal and Cifuentes which assign to urban and rural rents a figure approximately one-half Mr. Levine's. In short, Mr. Levine's estimate seems somewhat too high. On the other

[25] See *Renta Nacional, 1940–45*, Vol. 2, p. 182, col. 3.

hand, our own estimate is undoubtedly too low, partly because certain items, such as profits in some industries which we were unable to estimate, were omitted.

The distribution by industries in our own estimate (Table 24) is too crude to be very useful, since for lack of data the 'miscellaneous' item includes all industries that could not be estimated separately and constitutes in 1942 nearly 18 percent of national income. This fact prevents also a comparison by industries with Mr. Levine's estimate. In general, nevertheless, whenever the industries are defined in the same fashion the estimates are as nearly similar as the deficiencies in the data allow.

## E *Colombia*

### *Estimate prepared at the IASI, 1940*

Except for 'agriculture', income originating in the different economic groups of Colombia has been estimated by the payments approach from 1938 Census figures on the gainfully occupied, distributed by industries; some data on average earnings; and income tax data on which are based profits in mining, manufacturing, construction, transportation, communication and public utilities, trade and finance. In reality, 'profits' are defined broadly, covering certain amounts corresponding to labor and entrepreneurial income in some industries where individuals receive income within the taxable brackets, which are so high that, normally, common labor income is excluded. Income originating in agriculture was estimated on the assumption that net income is approximately 80 percent of the gross value of production.

The contribution of government is the sum of the wages and salaries paid by the national government, the states, and the municipalities and one-half of interest payments on the public debt — the proportion corresponding roughly to the part of the public debt that is held by Colombian nationals.

The estimate of the gainfully occupied for 1940 is based on the assumption that the changes since 1938 in each economic group or industry are strictly proportional to the net increase in population (Table 25). Since the period is short, it is possible that no great changes occurred in the relative importance of each industry as measured by employment data.

TABLE 24

Chile

National Income by Industry, 1936–1942

IASI Estimates

| | *1936* | *1937* | *1938* | *1939* | *1940* | *1941* | *1942* |
|---|---|---|---|---|---|---|---|
| | (millions of pesos at current prices) | | | | | | |
| Total | 9,122.3 | 10,505.0 | 12,061.5 | 11,494.9 | 12,953.1 | 15,641.9 | 19,630.9 |
| Agriculture | 2,048.8 | 2,533.4 | 2,781.5 | 2,486.3 | 2,721.7 | 2,967.0 | 3,751.2 |
| Mining | 641.2 | 716.0 | 811.3 | 879.3 | 921.7 | 1,086.9 | 1,129.7 |
| Manufacturing | 1,572.0 | 1,730.4 | 1,930.9 | 2,109.6 | 2,599.1 | 3,157.3 | 4,020.7 |
| Construction | 170.0 | 219.0 | 210.6 | 260.2 | 289.4 | 352.7 | 339.0 |
| Trade | 807.1 | 953.1 | 1,110.4 | 1,299.8 | 1,649.1 | 2,052.9 | 2,626.9 |
| Transportation, communication, & public utilities | 451.3 | 558.0 | 579.7 | 692.8 | 861.9 | 1,082.6 | 1,329.0 |
| Real estate | 423.0 | 490.0 | 557.0 | 622.0 | 688.0 | 799.0 | 855.0 |
| Finance | 143.0 | 174.7 | 187.5 | 200.9 | 232.4 | 294.7 | 331.6 |
| Service (domestic) | 117.5 | 141.6 | 156.1 | 188.8 | 230.9 | 268.0 | 327.0 |
| Government | 1,318.4 | 1,590.0 | 1,982.1 | 1,263.1 | 1,248.0 | 1,540.4 | 1,399.9 |
| Miscellaneous | 1,430.0 | 1,398.8 | 1,754.4 | 1,492.1 | 1,510.3 | 2,040.3 | 3,520.9 |

TABLE 25 Colombia

Gainfully Occupied, 1938 and 1940

| | 1938 Census | 1940 Estimate | % OF GAINFULLY OCCUPIED |
|---|---|---|---|
| | (thousands of persons) | | |
| Total population | 8,701.8 | 9,100.0 | .. |
| Total gainfully occupied | 3,120.9 | 3,263.0 | 100.0 |
| Agriculture & cattle raising | 1,935.1 | 2,023.0 | 62.0 |
| Mining | 75.4 | 78.0 | 2.4 |
| Manufacturing | 442.0 | 463.0 | 14.2 |
| Construction | 85.2 | 88.0 | 2.7 |
| Transportation, communication & public utilities | 62.9 | 65.0 | 2.0 |
| Trade | 157.6 | 163.0 | 5.0 |
| Finance | 6.9 | 7.0 | 0.2 |
| Services | 107.1 | 111.0 | 3.4 |
| Government | 58.4 | 62.0 | 1.9 |
| Other | 190.3 | 203.0 | 6.2 |

The gross value of agricultural production was 424,697,000 pesos in 1940 (Table 26).

TABLE 26 Colombia

Agricultural Production, Gross Value, 1940

| | THOUSANDS OF PESOS |
|---|---|
| Crop production, total | 240,213 |
| Coffee, exports [a] | 74,023 |
| Coffee, domestic consumption * | 6,250 |
| Corn * | 39,157 |
| Potatoes * | 27,060 |
| Wheat * | 22,659 |
| Rice * | 19,373 |
| Beans * | 7,220 |
| Cacao * | 6,000 |
| Fique * | 3,600 |
| Cotton * | 2,826 |
| Dividivi * | 122 |
| Anis * | 95 |
| Balsamo * | 91 |
| Balata * | 86 |
| Tague * | 41 |
| Coconut * | 1,000 |
| Sugar cane [b] | 25,000 |
| Bananas | 5,610 |

| | THOUSANDS OF PESOS |
|---|---|
| Animal production, total | 59,484 |
| Slaughter of: | |
| Cattle [c] | 45,130 |
| Hogs [c] | 13,543 |
| Sheep [c] | 702 |
| Other [c] | 109 |
| Fruit and dairy production, total | 125,000 |
| Fruits and vegetables [d] | 55,000 |
| Dairy products [d] | 70,000 |
| Total | 424,697 |

* Miguel Gomez Fernandez, *Tratado de Economía Colombiana.*

[a] *Anuario de Comercio Exterior*, 1941.

[b] Estimated on the basis of raw materials consumed by the sugar industry and the total quantities of sugar and panela produced in Colombia, according to the Ministerio de Economía Nacional.

[c] Official figures of reported slaughter and average prices in 'cattle markets' (ferias).

[d] Estimated on the basis of expenditures per person on these products according to 'Las Condiciones y el Costo de la Vida de la Clase Obrera en Medellin', *Anales de Economía y Estadística*, Oct. 1940. The investigation covered 201 families and 1,320 individuals.

Labor income was computed from the gainfully occupied and average earnings (Table 27). The employment figures were adjusted to exclude owners and managers, whose income is estimated separately.

TABLE 27

Colombia

Gainfully Occupied, Average Earnings, and Total Labor Income, 1940

| | GAINFULLY OCCUPIED | EARNINGS (pesos) | TOTAL LABOR INCOME (millions of pesos) |
|---|---|---|---|
| Mining | 78,000 | 500 [a] | 39.0 |
| Manufacturing [b] | | | |
| Wage earners | 175,000 | 430 | 75.3 |
| Employees (salaried) | 22,000 | 1,732 | 38.0 |
| Construction [c] | 88,000 | 400 | 35.0 |
| Transportation, communication & public utilities [d] | | | |
| Wage earners | 26,000 | 1,037 | 27.0 |
| Employees (salaried) | 39,000 | 454 | 18.0 |
| Commerce [e] | 163,000 | 1,200 | 195.0 |
| Finance [e] | 7,000 | 2,000 | 14.0 |

[a] Average earnings per day are 1.84 pesos. The number of working days was assumed to be 250.

[b] The income of the 266,000 managers and individual proprietors was computed from profits reported to the income tax authorities.

[c] Earnings in building construction are similar to those prevailing in manufacturing, although employment is not as steady. The figure adopted, 400 pesos, is somewhat less than that for manufacturing.

[d] Earnings are those for wage earners and salaried employees on Colombian railroads.

[e] The figures for earnings are rather arbitrary.

According to the various estimates described above, the national income of Colombia in 1940 must have been close to 1,097.6 million pesos (Table 28). 'Per capita' income was ap-

TABLE 28

Colombia

National Income, 1940

| | TOTAL | LABOR INCOME | PROFITS & OTHER |
|---|---|---|---|
| | (millions of pesos) | | |
| Agriculture | 340.0 | | |
| Mining | 88.5 | 39.0 | 49.5 |
| Manufacturing | 185.0 | 113.3 | 71.7 |
| Construction | 37.0 | 35.0 | 2.0 |
| Transportation, communication & public utilities | 56.7 | 45.0 | 11.7 |
| Trade | 211.0 | 195.0 | 16.0 |
| Finance | 30.0 | 14.0 | 16.2 |
| Real estate [a] | 46.1 | | |
| Government | 103.3 | 82.9 | 20.4 [b] |
| Total national income | 1,097.6 | | |

[a] See *Tratado de Economía Colombiana.*

[b] One-half of interest payments on the public debt.

proximately 116 pesos a year. Income per employed person for the country as a whole was 520 pesos; in agriculture, only 168 pesos. The latter figure seems reasonable when compared with a little over 400 pesos a year made on the average by workers employed in manufacturing, for whom more accurate information exists.

## F *Cuba*

### *Estimate of Eduardo Durruthy, 1943* [26]

Most of the information on which this estimate is based originates in income tax and other fiscal data and in figures published by a social security agency, the Workers Maternity Council (Caja de Maternidad Obrera). Other information necessary to complete the estimate comes from diverse sources not mentioned specifically.

The estimate is for income paid out and is classified by type of recipient or origin, according to the nature of the data available (Tables 29 and 30). In general, the figures seem fairly accurate and the results check with information on the value of commodity production and certain services. Some kind of check can also be made by comparing this estimate with two others on the value of production prepared by Julian Alienes Urosa and Carlos Raggi Ageo.[27] These, however, do not constitute national

TABLE 29

Cuba

National Income by Broad Groups, 1943

| | MILLIONS OF PESOS |
|---|---|
| Profits of commercial enterprises & individuals | 150.3 |
| Wages & salaries paid by federal, state, & municipal governments | 100.1 |
| Wages & salaries paid by industry & commerce | 229.2 |
| Wages & salaries paid by agricultural enterprises | 105.7 |
| Net income from urban & rural property | 82.8 |
| Other personal income, incl. interest on loans, government bonds & other titles, but excl. dividends | 37.4 |
| National income | 705.5 |

[26] Mr. Durruthy was Director General of Statistics in Cuba. His original estimate has not been published but was made available by Felipe Pazos, Commercial Attaché with the Cuban Embassy.

[27] *La Economía Nacional de Cuba* (Directorio Oficial de Exportación, Importación, Producción y Turismo, 1941), edited by Cuban Chamber of Commerce; and *Condiciones Económicas y Sociales de la Republica de Cuba* (Havana, 1944).

TABLE 30

Cuba

National Income by Minor Groups, 1943

| | MILLIONS OF PESOS |
|---|---|
| Total profits of enterprises and individuals | 150.3 |
| Enterprises covered by Tariff IV and Decree Law 1 | 74.2 |
| Banks | 1.6 |
| Sugar refineries | 9.1 |
| Mines | 0.4 |
| Railroads | 6.1 |
| Manufacturers of liquor, tobacco, etc. | 4.9 |
| Other corporations | 52.1 |
| Business men and industrialists covered by Tariff III | 49.9 |
| Enterprises and private individuals paying other taxes | 11.2 |
| Insurance companies | 3.8 |
| Foreign navigation companies | 5.0 |
| Enterprises dedicated to credit sales | 2.4 |
| Agricultural enterprises, tax exempt | 15.0 |
| Producers of sugar cane | 3.1 |
| Producers of tobacco | 3.2 |
| Producers of coffee | 1.7 |
| Other agricultural producers | 7.0 |
| Total wages, salaries, and pensions | 435.0 |
| Government | 100.1 |
| Federal | 91.2 |
| State | 1.0 |
| Municipal | 7.9 |
| Business and industry | 229.2 |
| Agricultural enterprises | 105.7 |
| Sugar cane sector | 64.1 |
| Tobacco sector | 11.0 |
| Coffee sector | 6.6 |
| Other agricultural activities | 9.0 |
| Stock raising industry | 15.0 |
| Total other income | 120.2 |
| Interest payments | 17.4 |
| On mortgages | 9.3 |
| On other loans | 1.2 |
| On foreign securities and others not specified | 2.0 |
| 90% of national debt interest payments | 4.9 |
| Professions | 20.0 |
| Income from urban and rural property | 82.8 |

income estimates in the usual meaning of the term because they are affected by some duplications in the value of commodity production and exclude a considerable share of the value of services.

### G *Dominican Republic*

### *Estimate of the Brookings Institution, 1940*[28]

National income is the aggregate net value of production in the various divisions of economic activity. Owing to the limitations of the data, only national income produced, classified into nine major groups, was computed (Table 31). Both cash and non-

TABLE 31
Dominican Republic
National Income, 1940

| | MILLIONS OF DOLLARS | PERCENTAGE DISTRIBUTION |
|---|---|---|
| Agriculture | 41.4 | 58.9 |
| Manufacturing | 7.8 | 11.1 |
| Government | 7.0 | 9.9 |
| Trade and service | 9.0 | 12.8 |
| Transportation & communication | 1.5 | 2.1 |
| Electric light & power | 0.5 | 0.7 |
| Construction | 0.8 | 1.1 |
| Forestry, fisheries, and mining | 0.9 | 1.3 |
| Finance | 1.5 | 2.1 |
| Total | 70.4 | 100.0 |
| *Minus* | | |
| Interest & dividends on foreign capital (net outflow) | 1.5 | |
| Net income produced | 68.9 | |

cash income received in the form of goods produced and consumed on farms were included.

Certain cost items were deducted from gross income. Only in some cases were the estimates based on wage data. Cost deductions for agriculture consisted mainly of recorded imports of implements, fertilizer, and other materials, plus taxes. Trade was derived by "applying estimated incomes of merchants to the corresponding number of trade establishments, taking into consideration differences in the social status of the various groups and the probable number earning a livelihood from trade". Income originating in the service industries was derived in a similar fashion. Statistics for railroads, telegraph, telephone, and postal services are relatively satisfactory. Of the estimates, 14 percent are judged to be fully reliable, 11 percent good, 60 percent fair approximations, and 15 percent informed guesses.

[28] *Refugee Settlement in the Dominican Republic* (1942). This book is the result of co-operative work by several members of the Institution's staff; the chapter on Employment, Wages and National Income was written by Ellis Goodwin.

*Note on the gainfully occupied.* According to *Album Estadistico Grafico*, published by the Republic's Bureau of Statistics in 1944, 394,800 or 81.6 percent of the gainfully occupied in 1935 were in agriculture. In the Bureau's tabulation government employees are classified in their respective 'professions' or included in the 'ill-defined' group. A similar procedure is said to have been followed for the armed forces, the clergy, and the police. In general the figures check with other information published in official yearbooks. However, a large number of women were excluded from agriculture because of the temporary character of their occupation. The 1935 Agricultural Census reported 355.9 thousand men and 120.5 thousand women employed in agricultural pursuits. Accordingly, the estimate of the gainfully occupied was adjusted by substituting for the original agricultural employment figures those of the 1935 Census of Agriculture.

| | MEN | WOMEN | TOTAL | % |
|---|---|---|---|---|
| | (thousands) | | | |
| Agriculture * | 355.9 | 120.5 | 476.4 | 84.3 |
| Manufacturing | 25.5 | 9.8 | 35.3 | 6.2 |
| Transportation & communication | 4.1 | 0.1 | 4.2 | 0.7 |
| Trade | 11.1 | 1.7 | 12.8 | 2.3 |
| Professions | 2.8 | 1.8 | 4.6 | 0.8 |
| Other | 26.9 | 5.2 | 32.1 | 5.7 |
| Total gainfully occupied | 426.3 | 139.1 | 565.4 | 100.0 |
| % of total population | | | 37.6 | |

* The figures reported in the *Album Estadistico Grafico* are 384,900 men and 9,900 women.

## H *Ecuador*

### *National Bureau of Statistics Estimate* [29]

Statistical data are such that any attempt to estimate the national income of Ecuador must necessarily be subject to very great handicaps. For example, the total population is unknown, since a complete census has never been taken.[30] Estimates vary widely.

In recent years several national income estimates have been made available. Apparently the first was prepared by Laso in

[29] *Ecuador en Cifras*, 1938–42 (Direccion Nacional de Estadistica), pp. 186–93.

[30] General Luis T. Paz y Mino estimates 3,746,545 persons for 1941 (*La Poblacion del Ecuador*; Quito, 1942). Luis Laso mentions 3 million for approximately the same date.

1942; another, by E. Riofrio Villagomez, appeared in 1943.[31] The experience gained through these two estimates has been embodied in a study published in the *Yearbook of Ecuador for 1938–42*. The national wealth and national income figures do not refer to any specific year and are designated 'annual estimates' (Table 32).

TABLE 32
Ecuador
Wealth and National Income (annual estimates)

| | MILLIONS OF SUCRES |
|---|---|
| National capital | 5,000 |
| Rural property (official valuation plus 60%) | 1,500 |
| Urban property | 1,470 |
| Capital placed at interest & non-productive capital | 600 |
| Capital invested in industry & commerce | 500 |
| Banking capital, including deposits | 400 |
| Cacao plantations | 400 |
| Bonds, stocks, & shares | 70 |
| Small agricultural, commercial & industrial capital, & urban property not registered | 60 |
| National income | 1,500 |
| Income of domestic servants, agricultural workers, small commercial enterprises, Indian families & workers not registered with the Social Security | 725 |
| Labor income according to Social Security data | 210 |
| Banking capital, commerce & industry & capital placed at interest | 205 |
| Rural property | 200 |
| Urban property | 160 |

*Distribution of Income*

| NO. OF FAMILIES (4 members) | AV. MONTHLY INCOME PER FAMILY (sucres) | AV. ANNUAL INCOME * (sucres) | TOTAL INCOME (millions of sucres) |
|---|---|---|---|
| 500,000 | 90 | 1,080 | 540.0 |
| 200,000 | 200 | 2,400 | 480.0 |
| 30,000 | 300 | 3,600 | 108.0 |
| 10,000 | 500 | 6,000 | 60.0 |
| 6,000 | 1,000 | 12,000 | 72.0 |
| 2,000 | 2,500 | 30,000 | 60.0 |
| 1,000 | 4,000 | 48,000 | 48.0 |
| 500 | 8,000 | 96,000 | 48.0 |
| 300 | 10,000 | 120,000 | 36.0 |
| 100 | 15,000 | 180,000 | 18.0 |
| 70 | 20,000 | 240,000 | 16.8 |
| 30 | 30,000 | 360,000 | 10.8 |
| 750,000 | | | 1,497.6 |

* Not given in the original table.

[31] Laso's estimate ('Breves Consideraciones sobre la Economia Ecuatoriana', *Boletin Mensual del Banco Central del Ecuador*, March 1942, p. 14) indicates only the number of families in the lower and higher income brackets.

Villagomez's estimate ('Algunos Datos sobre la Evolucion Financiera y Economica en el Ecuador', *Boletin Mensual del Banco Central del Ecuador*, April–May 1943, pp. 21–41), which seems to be for 1941 or 1942, gives a total national income of 1,604 million sucres.

Part of the information on which the estimate of the National Bureau of Statistics (Direccion Nacional de Estadistica) is based came from a special survey of the property and income of over half a million persons taken when the National Defense Tax (Impuesto a la Defensa Nacional) was established. It is stated, nevertheless, that the results of the inquiry were deficient and that only 30 percent of those who should have declared property or income actually did so.

## I *Mexico*

### *Estimates of Emilio Alanís Patiño, 1929 and 1940*[32]

Alanís Patiño's estimates for 1929–30 gave national income as 20 percent of national wealth. A new estimate of national wealth was prepared for 1940 (Table 33). On the assumption

TABLE 33
Mexico
National Wealth, 1929 and 1940

| | *1929* | *1940* |
|---|---|---|
| | (millions of pesos) | |
| National wealth | 10,024.5 | 15,342.6 |
| Invested in: | | |
| Primary production | 4,045.5 | 5,562.3 |
| Private agricultural property | 2,418.5 | 1,776.0 |
| Agricultural property | 247.1 | 938.8 |
| Livestock, poultry, and bees | 753.6 | 973.9 |
| Government land | 46.8 | 52.0 |
| Petroleum | 120.7 | 244.3 |
| Minerals | 156.0 | 674.2 |
| Other extractive industries | 6.9 | 7.5 |
| Electric industries | 295.9 | 895.6 |
| Secondary production | 684.4 | 914.1 |
| Manufacturing | 654.4 | 872.1 |
| Craftsmen | 30.0 | 42.0 |
| Production of services | 5,294.6 | 8,866.0 |
| Railroads and street cars | 1,451.5 | 1,708.9 |
| Private buildings not included above | 1,938.8 | 2,631.7 |
| Commercial enterprises | 617.0 | 1,018.9 |
| Other | 1,287.3 | 3,506.5 |

that national income constitutes the same proportion as in 1929, Patiño states that in 1940 it must have been about 3,070 million pesos — a figure corresponding roughly with our own estimate (Table 43).

[32] The 1929 estimate was published in *Mexico en Cifras* (Secretaria de la Economia Nacional, Direccion General de Estadistica, 1938), Ch. 30. The 1940 estimate appeared in *Estadistica*, March and June 1943. Patiño mentions another estimate by General Abelardo Rodriguez which gives an income of 6,916 million Mexican pesos, but by all tests this figure for 1941 must be considered exaggerated.

The figure for agriculture, forestry, etc., in Table 34 is ap-

TABLE 34
Mexico
National Income, 1929

| | MILLIONS OF PESOS |
|---|---|
| National income | 2,042.3 |
| Originating in: | |
| Primary production | 684.9 |
| Agriculture, forestry, etc. | 570.1 |
| Mining (wages & salaries only) | 112.3 |
| Hunting and fishing | 2.5 |
| Secondary production | 346.0 |
| Manufacturing | 237.2 |
| Power plants (wages & salaries only) | 14.9 |
| Craftsmen | 93.9 |
| Services | 1,011.4 |
| Public administration (expenses of federal, state, & municipal governments) | 398.2 |
| Wholesale & retail trade | 258.8 |
| Professions | 84.9 |
| Railroads & street cars | 99.2 |
| Domestic services | 11.2 |
| Business & residential real estate | 80.0 |
| Income of persons in: | |
| Transportation | 30.4 |
| Sea & inland transportation | 7.1 |
| Banking & insurance | 2.0 |
| Hotels, restaurants, etc. | 2.3 |
| Amusement industry | 0.7 |
| Building industry | 36.8 |

proximately equal to the gross value of production in official yearbooks. Furthermore, as indicated under 'public administration', expenditures of state and municipal as well as federal governments, are included. On the basis of these two items, Patiño's estimate of total national income for 1929 seems to suffer from a slight upward bias.

According to official figures, agricultural production increased 59 percent in value between 1929 and 1940; mineral production 82 percent, manufacturing, 56 percent.[33] If these percentages are weighted by the contribution of each industry to national income in 1929 the composite index, according to Patiño, would rise 61 percent. National income in 1940, computed by applying this percentage to the 1929 figures, should be close to 3,288 million pesos. Another estimate, also of a very synthetic nature, is presented in Table 43.

[33] Direccion General de Estadistica, *Revista de Estadistica,* April 1945.

## J *Panama*

### *Estimate prepared at the IASI, 1942* [34]

The Republic of Panama covers 32,380 square miles of territory joining North and South America. The principal ports are Panama and Colon, where one-fourth of the 622,576 inhabitants of the country live (1940 Population Census). Most of the trade, however, goes through the Canal Zone, a strip of land five miles wide on each side of the Canal connecting the Pacific Ocean with the Caribbean Sea, with its cities, Balboa and Cristobal.

The strategic location of Panama, with the substantial transportation of goods and passengers through the Canal, brings a great deal of trade and many tourists. Still, Panama is mainly an agricultural country: over half of its active population is engaged in agriculture.[35] The agricultural economy of Panama nevertheless differs from that of the other Latin American countries in that it is not geared for export trade. Panama's exports are almost exclusively bananas, which normally make up over 75 percent of the total value of exports; cacao beans and coconuts make up most of the rest. Total exports are, however, very small; in 1941 — one of the best years on record — they amounted to only a little over 4 million balboas.

But the export trade does not give a complete picture of the Panamanian economy. Imports are usually five to six times larger than exports, the deficit being covered by receipts from passenger and commodity trade through the Isthmus, government receipts from rentals in the Canal Zone, import duties levied on commodities consumed partly in the Canal Zone, and wages and salaries paid in the Canal Zone to workers and employees living within Panama's jurisdiction.

For the above reasons, although Panama is essentially an agricultural country, the major part of its national income originates in trade and service activities directly connected with activities in the Canal Zone.

(1) ADEQUACY OF THE DATA. The Panamanian statistical

[34] In the preparation of this estimate we profited from the invaluable experience of Thomas C. Corcoran, former Director General of Statistics of Panama, as well as from the cooperation of Jose Cristobal Sanchiz of the General Bureau of Statistics.

[35] This percentage is based on the so-called 'civil' or 'non-Indian' population only. In 1940, 55,987 Indians, 9 percent of the total population, lived in tribal units.

data are going through a transitional period. Since 1940, when a new and excellent population census was taken, the General Bureau of Statistics (Direccion General de Estadistica) has been widening the range and raising the quality of its published material. Nevertheless, the information is still too limited to permit more than a rough appraisal of the probable magnitude of national income. An agricultural census was taken in 1942, but proved to be of such small value that in 1943 a new census, covering only the District of Penonome in the Province of Cocle, was undertaken. Only some results of the latter have been published.

As for periodic data, the General Bureau of Statistics published production figures for a few agricultural and manufacturing products, some public finance, foreign trade, railroad transportation, and building construction. Price data are confined to retail prices of food and clothing in the City of Panama, where conditions are considerably better than in the interior of the country. Owing to this lack of price data, the evaluation of the agricultural and industrial production in balboas is quite unsatisfactory.

(2) GAINFULLY OCCUPIED. In 1940 Panama had a population of 622,576, of whom 55,987 were Indians living in settlements and Indian villages. Of the 'non-Indian' population 25.5 percent was concentrated in Panama City and Colon, the former having 112,000 persons (19.7 percent). Of the total population, excluding Indians living in tribes, 36.3 percent were gainfully occupied; and of these, 52.3 percent, according to the Census of 1940, were in agriculture (Table 35).

TABLE 35
Panama
Gainfully Occupied (excluding tribal Indians), 1940

| | NUMBER | % OF GAINFULLY OCCUPIED |
|---|---|---|
| Agriculture | 107,680 | 52.3 |
| Extractive industries | 373 | 0.2 |
| Manufacturing | 14,596 | 7.1 |
| Construction | 8,136 | 4.0 |
| Transportation & communication | 4,433 | 2.2 |
| Commerce | 10,344 | 5.0 |
| Personal services | 19,428 | 9.4 |
| Public services & professions | 10,461 | 5.1 |
| Employees in Canal Zone | 28,049 | 13.6 |
| Unknown | 2,259 | 1.1 |
| Total | 205,759 | 100.0 |

(3) PROBABLE SIZE OF THE NATIONAL INCOME. The statistical data and other information available, as stated above, are such that the national income of Panama can be only roughly estimated. All indications seem to point, however, to a figure of 78.9 million balboas in 1942, excluding whatever income should be imputed to the 9 percent of the population living in Indian tribes under a purely non-cash economy. Still, a part of the above amount is made up of non-cash income accruing to the agricultural part of the so-called 'non-Indian' or 'civil' population. Of the 78.9 million balboas, agriculture contributes 22.1 million; manufacturing, 7.5 million; building construction, 1.2 million; government, 12.9 million; the Canal Zone, 10.2 million; and other groups, 25 million.

On the basis of 80 million balboas for national income in 1942, income per capita is 143 balboas a year, or approximately 400 balboas per gainfully occupied. Income per gainfully occupied person in agriculture does not seem to exceed 220 balboas a year, while in government it is as high as 1,000 balboas.

*Agriculture.* The share of the national income accruing to agriculture was estimated by evaluating agricultural production in 1942 at the retail prices prevailing in Panama City (Table 36). For a small group of fruits and vegetables it was

TABLE 36
Panama
Agricultural Production, Approximate Retail Price Value, 1942

| | UNIT | QUANTITY [a] | PRICE [b] | VALUE (thousands of balboas) |
|---|---|---|---|---|
| Brown rice | qq (100 lbs.) | 1,356,892 | 9.00 | 12,212 |
| Corn | qq | 777,347 | 3.75 | 2,915 |
| Beans | qq | 63,033 | 15.00 | 945 |
| Potatoes | qq | 17,509 | 9.00 | 158 |
| Yuca | qq | 1,183,506 | 5.00 | 592 |
| Name | qq | 483,834 | 7.50 | 3,629 |
| Plantains | matas de 100 | 4,048,453 | 2.21 | 8,947 |
| Sugar cane syrup | lbs. | 6,691,956 | 0.05 | 335 |
| Brown sugar | lbs. | 2,238,481 | 0.05 | 112 |
| Fresh milk | 1,000 cans | 25,234 | 80.00 | 2,019 |
| Eggs | 1,000 doz. | 4,740 | | 3,792 |
| Beef | Head | 58,364 [c] | [d] | 5,346 |
| Pork | Head | 59,084 [c] | [d] | 1,683 |
| Rubber | lbs. | | | 24 [e] |
| Total | | | | 42,709 |

[a] Official figures of the Agricultural Census of 1942, some of which are estimates.
[b] Balboas per unit; see *Estadistica Panameña.*
[c] Estimated.
[d] Prices are per pound 'on the hoof'.
[e] Value of exports in 1942.

possible to obtain both prices in Panama City and prices paid to farmers. The relation between these prices was applied to the total value of agricultural production at retail prices to yield an approximation of the part of gross agricultural production accruing to farmers. The estimate was increased by 5.9 million balboas to account for the net value of fruits and vegetables not included in the 1942 Agricultural Census and by 50 percent of the value of exports of bananas and cacao beans.

It is difficult to give exactly the margin or difference between prices prevailing in Panama City and those paid to farmers. An idea, however, can be obtained by comparing the minimum prices paid farmers by the Food Supply Division of the Institute of Inter-American Affairs with retail prices in Panama City, which are comparable for six products (Table 37).

TABLE 37
Panama
Relation between Prices Paid Producers and Retail Prices

| | UNIT | RETAIL PRICES IN PANAMA [a] (1) | PRICES PAID PRODUCERS [b] (2) | (2) AS % OF (1) |
|---|---|---|---|---|
| | | (cents of balboas) | | |
| Carrots | lb. | 15.0 | 4.0 | 26.7 |
| Cabbage | lb. | 15.3 | 4.0 | 26.1 |
| Chayote | lb. | 5.0 | 2.0 | 40.0 |
| Tomatoes | lb. | 15.0 | 5.0 | 33.3 |
| String beans | lb. | 15.0 | 5.0 | 33.3 |
| Oranges | unit | 3.7 | 1.5 | 40.5 |

[a] Average of July–August 1944.
[b] Prices paid by the Institute of Inter-American Affairs, Food Supply Division, August 1943 to July 1944. As prices remained quite stable, the comparison is not unduly affected by the difference in dates.

If it is assumed that the ratio of prices paid to farmers by the IIAA to retail prices in Panama City, i.e., roughly .40, applied generally to agricultural production, the value would have been about 17 million balboas in 1942, made up of cash income from actual sales and income in kind, i.e., consumption at the farm of part of the production. Farm income from staple production is perhaps larger since it probably should be increased by the value of transportation, which quite often is undertaken by the farmers.

The net value of fruit and vegetable production is estimated to be 3 million balboas, or approximately 15 percent of the net value of all other agricultural products. In addition, agricul-

tural income must be increased by net income originating in the production of bananas and cacao, 1.8 and 0.3 million balboas respectively. The net value of the production accruing to farmers is estimated to be one-half of the reported export value.

In sum, the net value of agricultural production, or net income accruing to farmers — in cash and kind — is 22.1 million balboas consisting of income from (a) the production of large crops, 17 million balboas; (b) the production of fruits and vegetables, 3 million balboas; (c) exports of bananas and cacao, 2.1 million balboas.

*Manufacturing.* According to the 1940 Population Census, 14,596 persons or 7.1 percent of the gainfully occupied were employed in manufacturing. The beverage (liquor and beer) and food processing industries have the largest capital investments. The industries listed in Table 38 employ only 5,739

TABLE 38

Panama

Summary Data on Principal Manufacturing Industries, 1942

| | EMPLOYMENT | CAPITAL INVESTMENT | OUTPUT |
|---|---|---|---|
| | | (thousands of balboas) | |
| Soft drinks | 760 | 3,795.6 | 1,130.7 |
| Sugar | 1,535 | 1,595.0 | 1,769.0 |
| Miscellaneous foods | 523 | 1,473.5 | 1,186.0 |
| Clothing | 724 | 874.8 | 1,401.0 |
| Ceramic products | 678 | 772.6 | 956.0 |
| Printing | 411 | 595.0 | 1,090.0 |
| Furniture | 442 | 503.2 | 1,214.0 |
| Shoes | 351 | 468.0 | 1,254.0 |
| Soap | 121 | 133.0 | 729.0 |
| Mattresses and pillows | 55 | 54.0 | 276.0 |
| Miscellaneous | 139 | 243.3 | 417.0 |
| Total | 5,739 | 10,508.0 | 11,422.7 |

*Mining and Manufacturing Industries in Panama*, one of a series of reports on mining and manufacturing in the American Republics (United States Tariff Commission, Feb. 1944). The value of production assigned to the sugar industry is not given, but was estimated by applying prices to production figures from *Estadistica Panameña.*

persons; the approximately 9,000 persons not shown in the table are employed in the alcoholic and beverage industry (about 1,500), in small establishments, or as individual workers. The value of production created by these individuals and firms is practically impossible to estimate. If productivity per employed were similar to the average for the firms and industries for which there are data, the total value of industrial pro-

duction would be close to 30 million balboas. Of this amount, probably one-fourth (7.5 million balboas) is constituted by wages and salaries and other income items.

*Building construction.* The gross value of building construction in Panama City and Colon in 1942 was 2.6 million balboas. Since, according to the Population Census of 1940, employment in the building construction industry in these two cities constitutes 67 percent of total employment in the country for this industry, it is estimated that the total value of building construction must have been approximately 4 million balboas in 1942. For the purposes of this estimate, it was assumed that 30 percent of this gross value (1.2 million balboas) must have been contributed by wages, salaries, and other income items.

*Government.* Governmental expenditures during the two years January 1941–December 1942 were 37,660,200 balboas, of which 23,607,300 or 62.7 percent are represented by wages, salaries, pensions, rents, and other payments to individuals (Table 39). Since the budget is prepared for two-year periods it

TABLE 39

Panama

Government Expenditures, 1941–1942

| | TOTAL | WAGES, SALARIES, PENSIONS, ETC. |
|---|---|---|
| | (thousands of balboas) | |
| Government and justice | 7,441.9 | 5,541.5 |
| Foreign relations | 992.2 | 925.0 |
| Finance and treasury | 2,489.9 | 1,336.6 |
| Education | 5,648.3 | 4,881.3 |
| Health and public works | 14,068.2 | 10,309.9 |
| Agriculture and commerce | 979.4 | 359.7 |
| Comptrollership | 334.1 | 252.3 |
| Foreign debt | 1,960.0 | .. |
| Internal debt | 3,327.0 | .. |
| Other | 419.2 | .. |
| Total | 37,660.2 | 23,607.3 |
| 1942 (54.2% of Total) | | 12,800.0 |
| Interest on internal debt | | 87.2 |
| Total government contribution to national income | | 12,887.2 |

is difficult to separate exactly the part of the payments to individuals that is for a single year. Total actual expenditures in 1942, however, were 54.2 percent of expenditures during 1941–42. Accordingly, payments to individuals must have been close to 12.8 million balboas. In addition, 174.4 thousand balboas

were paid out as interest on the internal debt. Approximately half was for 1942.

*Employees in the Canal Zone.* In 1940 the United States government employed 28 thousand Panamanians in the Canal Zone — approximately 3,000 on the so-called 'gold roll'; 25,000, on the 'silver roll'. Conditions of employment differ in the two rolls; those on the silver roll had average earnings of 51 balboas a month, or 612 for the year; those on the gold roll, about 100 a month, or 1,200 for the year. Changes in average earnings between 1940 and 1942 were apparently very small, but total employment increased approximately one-fourth. Not all the income accruing to these Panamanians in the Canal Zone constitutes income for Panama. It is estimated that about 60 percent of the wages and salaries are spent within the Canal Zone on the purchase of food, clothing, and other supplies from the United States Commissaries and Post Exchanges. Accordingly, income actually accruing to Panama from the employment of its citizens in the Canal Zone must have been 10.2 million balboas in 1942.

| | MILLIONS OF BALBOAS |
|---|---|
| 34,000 employees at B/51 (silver roll) | 20.8 |
| 4,000 employees at B/100 (gold roll) | 4.8 |
| Total salaries of Panamanians in the Canal Zone | 25.6 |
| Part remaining in Panama (40% of Total) | 10.2 |

*Other economic sectors.* The economic sectors whose contribution to the national income of Panama has been estimated in one way or another employed approximately 185.4 thousand persons in 1940: 107.7 thousand in agriculture, 14.6 thousand in manufacturing, 8.1 thousand in construction, approximately 13 thousand in government, and 42 thousand in the Canal Zone.

The difference between the 227 thousand estimated as the gainfully occupied in 1942 [36] and this total represents those employed in the extractive industries, transportation, communication, commerce, personal service, and other. Information on average earnings for these groups is very limited. Apparently

[36] Estimated by assuming that the gainfully occupied would constitute the same percentage of total population as in 1940. Total population was estimated by assuming that the growth after 1940 would have been at the same rate as during 1930–40, i.e., between the last two censuses. Since the 1930 Census was defective in recording the Indian population, the latter was also excluded from the 1940 Census results.

the only data available come from the Social Security Fund (Caja de Seguro Social), which covers approximately 40,000 workers and employees in government activities, trade, manufacturing, and other. For July 1943–June 1944 the Caja has published the average wages and salaries of members who received insurance or hospital benefits. The sample covers 12,829 of whom 7,811 are men, earning on the average 83 balboas a month, and 5,018 women, earning on the average 59 balboas a month. If these earnings are weighted by the number of men and women who according to the 1940 Census were engaged in all kinds of pursuits except agriculture, the average earnings of the two sexes together are 76 balboas a month.

It is difficult to tell whether this average is representative for wage earners in other economic sectors. Workers with the lowest average earnings probably utilize health and insurance benefits more than others. On the other hand, the Caja covers mainly workers and employees in Panama City and Colon, where earnings are usually higher than in the rest of the country. The inclusion of government employees in the sample may also affect the average. As was shown in the discussion on government, total wage-salary payments to the approximately 13,000 government employees in 1942 amounted to 12.8 million balboas. Per capita income in government is then 82 balboas a month, i.e., slightly higher than that for the Caja sample. Consequently, it was decided to adopt the figure of 50 balboas a month or 600 a year as average earnings of the 42 thousand odd persons in the group employed in 'other economic sectors'. Accordingly, their income must have been close to 25 million balboas in 1942.

## K *Perú*

### *Estimate of Emilio G. Barreto, 1942*

No estimate of Peruvian national income except that by Emilio G. Barreto (unpublished) exists (Table 40). Previous attempts succeeded in elaborating partial estimates of gross or net values for only some of the most important sectors of the economy. Among them are an estimate of the value of agricultural production by Ing. Romulo Ferrero and a national income estimate (incomplete) published in 1938 by the Commercial Department of the Ministry of Foreign Affairs (Official Publication 9).

TABLE 40

Peru

National Income, 1942

| | MILLIONS OF SOLES |
|---|---|
| Agriculture | 666.2 |
| Mining | 284.7 |
| Manufacturing, incl. household industries | 280.3 |
| Services (transportation, construction, radio, newspapers, electricity, gas, hotels, etc.) | 306.8 |
| Professional services | 12.0 |
| Trade (wholesale and retail) | 213.0 |
| Finance (banking and insurance) | 80.8 |
| Government | |
| Industrial and trade activities | 50.4 |
| Services | 140.0 |
| Miscellaneous | 50.7 |
| Total | 2,085.1 |
| *Minus* | |
| Duplications | 41.7 |
| Total national income | 2,043.4 |

Dr. Barreto was able to use the 1940 Population Census as well as a considerable amount of other official information, some unpublished. Consequently, his estimate, although necessarily preliminary, is based upon more and better data than is usually the case for countries at a similar stage of statistical development.

The concepts underlying the estimate are the usual ones and the net contribution of each economic group is equal to the sums earned by the productive factors engaged, whether such sums are paid out or not. The only important difference between his estimate and those for most other countries is the exclusion of agricultural production consumed by the household. Dr. Barreto suggests that approximately 40 percent of the total production of the Indian communities in the Highlands (Sierra) is for home consumption. He excludes this sum on the ground that these Indian communities are in reality outside the economic life of the country. No sum seems to have been assigned for rents of buildings occupied by their owners.

## L *Venezuela*

### *IASI Estimate, 1936*

A rough industrial distribution of its population indicates that Venezuela is primarily an agricultural country. Although no

investigation of the size and distribution of the gainfully occupied was made in the 1936 Population Census, it has been estimated that 85–90 percent of the active population was engaged in agricultural or pastoral pursuits. Total population in 1936 was 3.4 million persons, of whom perhaps 1 million, or 32 percent, were in the active group.[37] Of these, 56,000 were employed in manufacturing; 14,000 in the petroleum industry (extraction and refining); 43,000 in trade; and 15,000 in the various service industries.[38] Apparently no figures are available on employment in government, but in view of the size of the budget and the probable average wage-salary payments, it would seem that about 25,000 persons were employed by central and municipal agencies. Accordingly, close to 850,000 persons must have been employed in agricultural and pastoral pursuits. But despite their extraordinary importance as far as employment is concerned, the share accruing to those engaged in them does not exceed one-half of the national income. Income per employed in agriculture was about 600 bolivars in 1936; in manufacturing, 2,000; and in trade and services, 3,000–4,000. Average per capita income is about 324 bolivars a year.[39]

Data in censuses taken during 1936 and 1937 (population, agriculture, manufacturing, trade, and services) facilitated considerably the task of estimating the approximate national income (Table 41). The estimate was prepared from information from these censuses published in the statistical yearbooks of Venezuela for 1938, 1940, 1942, and 1943, and some figures on the petroleum industry in *Estadistica del·Petroleo* for 1936, 1937, and 1938.

Practically all the items that make up the estimate, therefore, were taken directly from the various censuses. The only exceptions are agriculture, gold, diamond and coal mining, and government.

[37] Based on the percentages obtained for the Federal District and the State of Anzoategui, for which the results of the 1941 Census — which investigated the gainfully occupied — have been published.

[38] Census of Service Industries, which covers (a) hotels and restaurants; (b) personal services and amusements; (c) transportation, communication, and other services; (d) banks and insurance; (e) other. Employment figures in manufacturing, trade, and service industries include owners, estimated to be 1 per establishment.

[39] The cost of living in large cities (see *Investigacion sobre el Cost de la Vida en Caracas*, Ministerio de Fomento, 1940) is much higher than in rural areas. The range in average earnings between different provinces shows a similar difference.

Table 41
Venezuela
National Income, Provisional Estimate, 1936

| | TOTAL | WAGES & SALARIES | PROFITS, WAGES, & ENTREP. INCOME | RENT |
|---|---|---|---|---|
| | (millions of bolivars) * | | | |
| Agriculture | 500.0 | 173.5 | 278.8 | 47.7 |
| Mining | 81.4 | 81.4 | | |
| Petroleum | 57.4 | 57.4 | | |
| Gold, diamonds, & coal | 24.0 | 24.0 | | |
| Manufacturing | 111.4 | 63.6 | 47.8 | |
| Food industries | 41.3 | 23.6 | 17.7 | |
| Textiles | 16.0 | 9.6 | 6.4 | |
| Printing | 6.7 | 4.8 | 1.9 | |
| Leather | 10.0 | 6.1 | 3.9 | |
| Stone, clay, & glass | 5.0 | 3.3 | 1.7 | |
| Wood | 6.2 | 3.3 | 2.9 | |
| Other | 26.2 | 12.9 | 13.3 | |
| Trade | 125.1 | 39.9 | 72.3 | 12.9 |
| Food & beverages | 59.3 | 14.8 | 37.7 | 6.8 |
| Clothing | 25.6 | 7.6 | 15.6 | 2.4 |
| Medicinal & chemical products | 6.1 | 4.0 | 1.4 | 0.7 |
| Other | 34.1 | 13.5 | 17.6 | 3.0 |
| Services | 64.0 | 26.9 | 33.8 | 3.6 |
| Hotels & restaurants | 5.9 | 1.6 | 3.1 | 1.2 |
| Personal services & amusements | 20.5 | 5.5 | 13.6 | 1.4 |
| Transportation, communication & other | 22.4 | 14.9 | 7.1 | 0.4 |
| Banks & insurance | 11.1 | 3.1 | 7.8 | 0.2 |
| Other | 4.4 | 1.8 | 2.2 | 0.4 |
| Government | 215.0 | 215.0 | .. | .. |
| Total | 1,097.2 | 600.3 | 432.7 | 64.2 |

All data for manufacturing, trade, services and mining (oil) are from censuses taken in 1936. Agriculture is partly estimated from data in the 1937 Agricultural Census. Rents in agriculture were assumed to be 5 percent of the value of exploited land. Gold, diamond, and coal figures are 80 percent of the official gross value of production. Income originating in government is 80 percent of total federal and municipal expenditures.

* One bolivar is worth 30 American cents.

The 1937 Census of Agriculture reported the cash value of sales of agricultural products, 245.0 million bolivars, and the amounts paid in wages and salaries, 173.5 million. As consumption *in situ* must be important, it was estimated by applying the average prices obtained in actual sales to the total quantities produced as recorded in the Census. It was possible to ascertain the prices of practically all the major products reported. The gross value of production so computed is very close to 600 million bolivars, of which 500 (approximately 80 percent) was considered net income.

'Net income from gold, diamonds and coal' was computed simply by taking 80 percent of the official value of production. There is no information permitting an appraisal of the cost items that do not constitute income.

As it was impossible to obtain a detailed budget for government, it was assumed that approximately 80 percent of total expenditures must have been wage-salary payments. There are no interest payments, since Venezuela's internal debt is negligible.

The contribution of the mining, manufacturing, trade, and service industries is made up of wages and salaries, profits, and rents. The censuses do not indicate whether the amounts are those actually paid out. Profits are defined very broadly, including not only profits in the stricter sense but also entrepreneurial income and interest payments. Rents from residential real estate were not computed owing to lack of data. The only important item missing besides rents is profits in the mining industry (oil), but the fact that most oil is exploited by foreign companies makes its estimation unnecessary.

## M *Estimates Prepared at the IASI for Two Groups of Countries*

In the preceding pages about a score of national income estimates for twelve Latin American countries have been reviewed. In most cases the data on which they are based, although inadequate, have permitted at least an appraisal of national income divided into its chief components. For a few countries, however, the estimates are either unreliable or are for years too long before 1940 to be valid for today. The eight countries omitted may be classified into two groups. The first, covering Uruguay, Paraguay, El Salvador, and Honduras, includes countries for which information is confined to data on agricultural production, extractive industries, manufacturing, and building construction. Whatever information exists in these countries regarding trade, transportation, communication, and other service industries is too scattered and incomplete to be useful. Statistics for the second group of countries — Guatemala, Costa Rica, Nicaragua, and Haiti — are definitely inadequate for estimating national income.

A simplified type of estimate, providing information only on the commodity-producing industries, was prepared for the first group. Either as a check on the method or because the available estimates are not for recent years, Cuba, Mexico, Brazil, and Argentina were included. Briefly, the method consisted of estimating the net income originating in all the industries directly engaged in producing commodities, i.e., agriculture, extractive industries, manufacturing, and building construction. Once this share of national income had been computed, it was assumed that it would be a function of total national income, dependent on the share of total employment provided by these industries.

Even on *a priori* grounds, it would seem that there must be a certain definite relation between income created through the production of commodities and national income. It is known that the productivity of the service industries — as measured by per capita returns to production factors — is normally much greater than that of the primary and secondary.[40] Still it cannot but be dependent upon the productivity of the latter. This explains why a relatively large proportion of the population (over 40 percent) of countries that have a highly developed manufacturing industry, e.g., the United States and Great Britain, or a modern and efficient agriculture, e.g., New Zealand, Australia, Canada, or Argentina, are engaged in all types of service industries. For the same reason in countries where agriculture is primitive and industrial development not far advanced, the number engaged in the commodity-producing industries is very large, and the number in the service industries correlatively small. But in these countries, as in the more developed, the per capita share (productivity) of the population engaged in the service industries is also considerably larger than in the primary and secondary. However, despite the favorable position of the service industries, no shifts of population to them from the primary and secondary can occur unless preceded by a rise in the productivity of the commodity-producing industries, for a community will obviously not be in a position to pay for serv-

[40] Primary industries as defined here include not only agriculture but also extractive industries such as mining. Since mining in Latin America is often confined to the extraction of ore, it seemed better to put such industries in the primary rather than in the secondary group, which includes properly manufacturing and building construction.

ices until it produces something over and above bare necessities.[41]

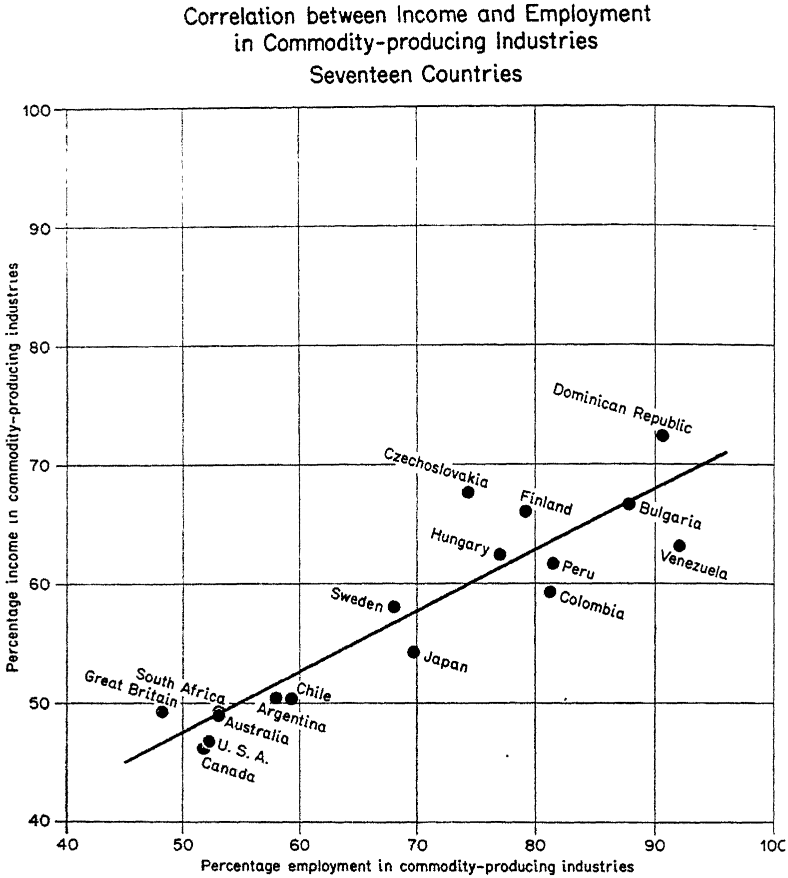
Statistical information on which to base an analysis of the relative share of income accruing to the service industries in Latin American countries is unfortunately very scarce. Of all the national income estimates reviewed, only six — those for Argentina, Chile, Colombia, the Dominican Republic, Venezuela, and Peru — are classified by industrial source and give comparable data on the gainfully occupied. These few countries represent, nevertheless, rather extreme conditions in the general Latin American economic picture since they are examples of relatively developed and undeveloped countries.

For these, together with eleven other American, European, and Asiatic countries, the ratio of income originating in commodity-producing industries to total national income was computed and the respective percentages correlated with percentages showing the proportion of employment provided by the same groups in comparison with total employment (see Table 42 and the chart). The regression line of the chart shows a high degree of correlation ($r$ = .90) between the two factors analyzed, i.e., income and employment in primary and secondary activities and total income and employment.[42] The six Latin American countries follow one pattern; indeed, the pattern is fairly general for practically every country for which figures are available.[43]

[41] Colin Clark in his *Conditions of Economic Progress* (Macmillan, London, 1940) deals at length with the factors affecting the productivity of the various industries and their influence on the level of national income, but in the end seems to assume that the productivity of the service industries is in some way independent of that of the primary and secondary. He asserts that "varying levels of tertiary productivity are among the most important factors that determine the average level of real income in countries as a whole" (p. 319). However, in countries where a greater proportion of the inhabitants are engaged in tertiary industries — the United States, New Zealand, Australia, and Great Britain — productivity in either the primary or secondary industries, or in both, is extremely high, according to Clark.

[42] The significance of the correlation coefficient, as tested by the method suggested by R. A. Fisher, shows that the probability of this coefficient's being exceeded by chance alone is less than .001.

[43] National income estimates for two other countries, The Netherlands and Turkey, could have been used but they deviated so much from the pattern of the seventeen countries that it became obvious that either the estimates themselves or the figures on the gainfully occupied were subject to considerable margins of error.




On the basis of the above evidence, it would appear that the absolute share of those engaged in the production of commodities increases arithmetically or in a fixed proportion with employment. Relatively, however, the increase in employment is faster than in income. This could be interpreted as indicating that per capita income in commodity-producing industries is proportionately smaller the larger the number of persons engaged in them. The order in which the countries cluster around the regression line as relative employment in primary and secondary industries increases (or as employment in service industries diminishes) is roughly similar to their order if ranked according to decreasing per capita income levels. In the chart the countries having higher employment in commodity-produc-

ing industries are those where real per capita income is probably smaller.

The relation obtained by the procedure described above was applied in estimating the proportion of income in tertiary activities for the group of countries for which income in commodity-producing industries only had been computed. The share of the service industries was based on the gainfully occupied (Table 42).[44]

As indicated previously, statistical information for these countries is meager and it has been impossible to determine directly the part of the gross value of production that constitutes net income. Consequently, 'net income' is assumed to be a fixed percentage of gross. For agriculture the figure selected was 80 percent, which accords with information available for other Latin American countries, such as Chile and Argentina. This percentage is higher than in the United States, but it must be remembered that in general agriculture in Latin America is not as mechanized as in the United States and that frequently certain services, such as transportation, create in reality agricultural incomes since they are undertaken by rural populations engaged also in agriculture. In manufacturing, the proportion selected was 30 percent, which is fairly stable, as can be ascertained by observing industrial data for the various countries. In mining, 60 percent was chosen, somewhat arbitrarily. Here there may be wider variations between countries according to the type of product mined, but, except in Mexico, the industry is relatively unimportant, so the error cannot be very large.

The results of applying the above method can be tested roughly by the national income figures for Argentina, Brazil, Cuba, and Mexico (Table 43). For the first, 7,936 million pesos for 1940 checks rather well with the 9,494 million given by the Ministry of Finance for 1941, if allowance is made for the fact that between these two years wholesale prices rose 17.4 percent. The estimate for Brazil (33.1 million contos) is lower than that of the Bank of Brazil but higher than that of Sr. Bulhoes. The estimate for Cuba (651 million pesos) agrees with the one pre-

[44] The equation of the regression line showing the proportion of total national income corresponding to a given percentage of employment in commodity-producing industries is $Y = 22.2 + .51X$, where $Y$ is the percentage of income and $X$ the percentage of employment.

TABLE 42

Seventeen Countries

Total Income and Employment, Main Industrial Groups

| | Income: Total | Income: Commodity-producing industries | Income: Service industries | Employment: Total | Employment: Commodity-producing industries | Employment: Service industries | % of income in commodity-producing industries | % of employment in commodity-producing industries |
|---|---|---|---|---|---|---|---|---|
| | (millions of the national currency) | | | (thousands) | | | | |
| Argentina, 1941 | 10,789 | 4,904 | 5,885 | 5,000 | 2,900 | 2,100 | 50.5 | 58.0 |
| Dominican Republic, 1940 | 70 | 51 | 19 | 565 | 512 | 53 | 72.4 | 90.6 |
| Colombia, 1940 | 1,098 | 651 | 447 | 3,263 | 2,652 | 611 | 59.3 | 81.3 |
| Chile, 1940 | 12,953 | 6,532 | 6,421 | 1,713 | 1,015 | 702 | 50.4 | 59.3 |
| Venezuela, 1936 | 1,097 | 693 | 404 | 1,000 | 920 | 58 | 63.2 | 92.0 |
| Peru, 1940 [a] | 2,043 | 1,261 | 782 | 2,475 | 2,017 | 458 | 61.7 | 81.5 |
| Australia, 1933 [b] | 584 | 286 | 298 | 2,870 | 1,523 | 1,347 | 49.0 | 53.1 |
| Bulgaria, 1934 [b] | 34,564 | 23,037 | 11,527 | 3,433 | 3,019 | 414 | 66.7 | 87.9 |
| Canada, 1940 [c] | 5,689 | 2,629 | 3,060 | 4,446 | 2,302 | 2,144 | 46.2 | 51.8 |
| Czechoslovakia, 1929 [d] | 96,000 | 65,000 | 31,000 | 6,992 | 5,204 | 1,788 | 67.7 | 74.4 |
| Finland, 1930 [b] | 18,000 | 11,900 | 4,700 | 1,715 | 1,359 | 356 | 66.1 | 79.2 |
| Great Britain, 1930 [e] | 3,289 | 1,622 | 1,667 | 18,455 | 8,888 | 9,567 | 49.3 | 48.2 |
| Hungary, 1930 [b] | 4,902 | 3,063 | 1,839 | 3,830 | 2,954 | 876 | 62.5 | 77.1 |
| Japan, 1930 [b] | 10,700 | 5,806 | 4,994 | 29,620 | 20,638 | 8,982 | 54.3 | 69.7 |
| South Africa, 1936–7 [f] | 369 | 182 | 187 | 705 [i] | 374 | 331 | 49.3 | 53.1 |
| Sweden, 1930 [g] | 8,323 | 4,837 | 3,486 | 2,892 [i] | 1,968 | 924 | 58.1 | 68.0 |
| United States, 1919 [h] | 67,854 | 31,737 | 36,117 | 39,818 | 20,825 | 18,993 | 46.8 | 52.3 |

[a] Income figures are for 1942. Population figures are from the 1940 Census.

[b] Income figures are from 'The National Income of Principal Foreign Countries', *Economic Record*, Aug. 3, 1939 (National Industrial Conference Board); employment figures are from *Yearbook of Labour Statistics, 1941* (International Labour Office). Both income and employment are for the same year.

[c] *Canada Yearbook, 1943–44*, pp. 800 and 1,067. Income figures are before adjustment for dividends and interest transferred abroad.

[d] Income figures are from the Monthly Report of the National Bank for Bohemia and Moravia, No. 155, 1939; employment figures from the *Yearbook of Labour Statistics, 1941*.

[e] Colin Clark, *National Income and Outlay* (Macmillan, London, 1937), p. 238.

[f] *South African Journal of Economics*, June 1944.

[g] E. Lindahl, *et al.*, *National Income of Sweden, 1861–1930*, I, 237.

[h] Simon Kuznets, *National Income and Its Composition, 1919–1938* (National Bureau of Economic Research, 1941) I, 326 and 346.

[i] *Yearbook of Labour Statistics, 1941.*

TABLE 43

Eight Latin American Countries

Estimated National Income

(millions of each national currency)

| | El Salvador 1940 | Honduras 1941–42 | Paraguay 1940 | Uruguay 1940 | Argentina 1940 | Brazil 1940 | Cuba 1942 | Mexico 1940 |
|---|---|---|---|---|---|---|---|---|
| Gross value | | | | | | | | |
| Agriculture | 67.3 | 42.1 | 57.0 | 138.7 | 2,900 | 17,532 | 299 | 1,409 |
| Extractive industries | [b] | [b] | [b] | [b] | 320 | 688 | 21 | 847 |
| Mfg. and construction | | | 30.7 | 382.0 | 5,330 | 19,200 | 388 | 1,384 |
| Net value | | | | | | | | |
| Agriculture | 53.8 | 33.7 | 45.6 | 111.0 | 2,320 | 14,025 | 239 | 1,127 |
| Extractive industries | [b] | [b] | [b] | [b] | 192 | 413 | 13 | 508 |
| Mfg. and construction | 15.3 | 15.0 | 9.2 | 114.6 | 1,599 | 5,760 | 116 | 415 |
| National income | | | | | | | | |
| Commodity-producing industries | 69.1 | 48.7 | 54.8 | 225.6 | 4,111 | 20,198 | 368 | 2,050 |
| Services [a] | 41.9 | 28.3 | 29.2 | 210.4 | 3,819 | 12,913 | 283 | 1,094 |
| Total | 111.0 | 77.0 | 84.0 | 436.0 | 7,936 | 33,111 | 651 | 3,144 |
| Employment & income in commodity-producing industries as % of total | | | | | | | | |
| Employment | 78.1 | 80.7 | 85.0 | 58.1 | 58.0 | 76.1 | 67.3 | 84.4 |
| Income [a] | 62.0 | 63.4 | 65.6 | 51.8 | 51.8 | 61.0 | 56.5 | 65.2 |

Estimated by using the regression line $Y = 22.2 + .51X$.

[b] Extractive industries are included with manufacturing.

pared by Sr. Durruthy for 1943. The increase in national income between 1942 and 1943 must be approximately 10 percent, as shown by the rise in total retail sales. If the same index (volume of sales) is applied to either the 1942 or 1943 estimate to calculate the national income of Cuba in 1940, the resulting figure is 488 million pesos. Finally, the estimate for Mexico agrees closely with the figure given by Ing. Alanís Patiño for 1939, since only slight changes in prices occurred between the two years.

Table 44 summarizes all the national income estimates presented for 1940, or when not possible for this year, for the nearest year.

## Notes to Table 43

### *El Salvador*

According to the 1930 Population Census, approximately 73 percent of the gainfully occupied were engaged in agriculture, 5.1 percent in manufacturing and construction, and 4.0 percent in trade. These figures are approximate because the Census classified the population by occupational activities, not by industrial groups. Two large groups (women in domestic occupations and persons without professions, including children) were subtracted from total population, although some of them were probably in the labor force.

The value of agricultural production was based on the quantity production and prices of nineteen products, published by the General Bureau of Statistics (Dirección General de Estadística) in the *1942 Yearbook*. These products apparently cover all agricultural production (*Estadística Forestal y Agraria, 1943*). Coverage with respect to the cultivation of foodstuffs is then complete. Fruits and lumber and a few exportable products not included among the nineteen were estimated separately to be one-fifth of the value of the known products (Table A). As figures on the value of manufacturing production are unavailable, net values were based on employment and average income; the latter was assumed to be three times as large as in agriculture.

TABLE A
El Salvador
Agricultural Production, Gross Value, 1940

| | MILLIONS OF COLONS |
|---|---|
| Coffee | 23.4 |
| Sugar | 9.4 |
| Corn | 7.9 |
| Maicillo | 3.2 |
| Rice | 2.2 |
| Beans | 2.6 |
| Balsamo | 0.8 |
| Cattle, slaughtered | 2.0 |
| Hogs, slaughtered | 3.2 |
| Other livestock and poultry | 0.6 |
| Other products (5) | 0.8 |
| Fruits and other products (20% of recorded production) | 11.2 |
| Gross value | 67.3 |

*Honduras*

According to the 1940 Population Census, 73 percent of the gainfully occupied (379,400 persons) were engaged in agricultural pursuits and extractive industries; 7.7 percent (29,200 persons) in manufacturing. The gross value of agricultural production is estimated to be 42.1 million lempiras (Table B). As figures on the value of manufacturing production are unavailable, net values were based on employment and average income; the latter was assumed to be three times as large as in agriculture.

TABLE B
Honduras
Agricultural Production, Gross Value, 1941–42

| | THOUSANDS OF LEMPIRAS |
|---|---|
| Total crops | 27,959.0 |
| Bananas | 8,859.6 |
| Corn | 6,525.6 |
| Coffee | 3,142.0 |
| Beans | 1,525.0 |
| Maicillo | 1,441.9 |
| Rice | 1,089.9 |
| Guineos | 933.4 |
| Plantains | 792.7 |
| Yuca | 611.9 |
| Mangoes | 483.7 |
| Tobacco | 402.1 |
| Aguacates | 351.2 |
| Other products | 1,800.0 |
| Total animal products | 14,113.5 |
| Poultry and eggs | 3,790.0 |
| Dairy products | 5,380.0 |
| Other animal products | 2,810.0 |
| Cattle, slaughtered | 1,160.0 |
| Hogs, slaughtered | 973.5 |
| Gross value | 42,072.5 |

*Informe de los Actos Realizados por el Poder Ejecutivo Nacional, Año Fiscal, 1942–43.*

### *Paraguay*

The population of Paraguay in 1940 is estimated to be 1,015,000 persons. As no census has been taken since 1886, little or nothing is known about its probable distribution by industries or activities. Apparently the coverage of Table C is relatively complete. The value of agricultural production has not been estimated since 1938. Raising the 1937–38 estimate for 18 important agricultural products, 45 million guaranies, 5 percent to take into account changes in acreage and prices, yields an estimate of 46.5 million guaranies for 1940. The estimate for milk, eggs, and poultry is based on consumption in Asuncion (105,000 inhabitants) in 1940.

TABLE C

Paraguay

Commodity Production, Total Value

| | MILLIONS OF GUARANIES |
|---|---|
| Production, 18 important agricultural products | 46.5 |
| Milk, eggs, and poultry | .8 |
| Exports of forest products, excluding tanino and petit-grain essence, 1940 | .5 |
| Cattle slaughtered, 1942 (350,517 heads at 26 guaranies each) | 9.2 |
| Manufacturing production, 1940 (Ministry of Industry and Commerce) | 30.7 |

### *Uruguay*

Since the last census was taken in 1908, there are no recent figures on the size and distribution of the gainfully occupied. Using information from the Agricultural Census of 1937 and the Industrial Census of 1936, it is estimated that approximately 45 percent of the gainfully occupied are engaged in agricultural pursuits, 10.9 percent in manufacturing, and 2.2 percent in construction. Employment in the extractive industries is very small, apparently not more than .3 percent.

Gross value of production, estimated by Alfredo O. Incierate, is published in the *Revista de la Federacion Rural*, July 1944, p. 36.

### *Argentina*

Since the last population census was taken in 1914, there are no recent figures on the size and distribution of the gainfully occupied. It was assumed that the labor force constitutes approximately 36 percent of the total population as shown by official estimates. According to the Agricultural Census of 1937, employment in agriculture was very close to two million. From the Census of Manufacturing it is estimated that 756 thousand are in manufacturing, mining, and building construction. On this basis, of the employed population, 4,750 thousand, 1,995 thousand are in 'other' (services).

Production figures for agriculture and manufacturing are from the 1943 Annual Report of the Central Bank. Figures on manufacturing were adjusted by separating mining (320 million pesos in 1940) and adding 600 million pesos to building construction.

### *Brazil*

Value of production figures are official estimates published by the Ministry of Foreign Affairs, 1940–41, and the Institute of Geography and Statistics (*Boletim Estatistico*). The only data not originating in official sources are the value of agricultural production for household consumption and that for building construction (Table D).

TABLE D

Brazil

Commodity Production, Total Value, 1940

| | MILLIONS OF CRUZEIROS |
|---|---|
| Agricultural | 17,532 |
| Agriculture proper | 7,413 |
| Cotton | 1,405 |
| Coffee | 1,345 |
| Wheat | 1,160 |
| Rice | 689 |
| Sugar cane | 654 |
| Mandioca | 529 |
| Beans | 423 |
| Other (13 products) | 1,208 |
| Animal | 5,119 |
| Cattle (oxen, hogs, etc.) | 2,554 |
| Milk, eggs, poultry | 1,937 |
| Other | 628 |
| Other production not reported in official statistics (estimated) | 5,000 |
| Extractive | 688 |
| Mineral | 238 |
| Gold | 112 |
| Coal | 72 |
| Other | 54 |
| Vegetable | 450 |
| Carnauba wax | 159 |
| Rubber | 89 |
| Brazilian tea | 43 |
| Babacu | 54 |
| Oiticica oil | 39 |
| Other | 66 |
| Manufacturing | 19,200 |
| Industrialized animal production | 4,666 |
| Meats | 2,490 |
| Hog fats | 505 |
| Salted beef | 292 |
| Dried hides | 286 |
| Dairy products | 507 |
| Other | 586 |

TABLE D (*Continued*)

| | |
|---|---|
| Other manufacturing | 12,840 |
| Textiles | 2,715 |
| Textile and fur products | 1,293 |
| Food products | 1,417 |
| Beverages | 932 |
| Tobacco | 378 |
| Metal products | 745 |
| Shoes | 852 |
| Pharmaceutical products | 575 |
| Vehicles | 597 |
| Paper | 378 |
| Steel and steel products | 340 |
| Other products | 2,612 |
| Building construction | 1,700 |

*Cuba*

All the figures are from Carlos M. Raggi Ageo, *Condiciones Economicas y Sociales de la Republica de Cuba* (Havana, 1944). Of the 4,232,000 inhabitants, 1,580,000 were in the labor force in 1942. The largest percentage of the latter, 48.3, were in manufacturing. The value of

| | LABOR FORCE Thousands | Percentage |
|---|---|---|
| Manufacturing (incl. rural workers in the sugar industry) | 763.0 | 48.3 |
| Agriculture proper | 300.0 | 19.0 |
| Transportation | 62.0 | 3.9 |
| Commerce | 210.0 | 13.3 |
| Government | 245.0 | 15.5 |

commodity production was 707,937 thousand pesos; the largest component, 388,053 thousand pesos, was manufacturing.

| | VALUE OF PRODUCTION (thousands of pesos) |
|---|---|
| Extractive industries | 21,324 |
| Forestry | 5,827 |
| Fishing | 6,000 |
| Mining | 9,497 |
| Agriculture | 298,560 |
| Sugar (part going to agricultural producers) | 119,360 |
| Tobacco (23% of finished products) | 24,200 |
| Other products | 130,000 |
| Cattle raising | 25,000 |
| Manufacturing | 388,053 |
| Sugar | 232,800 |
| Tobacco | 41,250 |
| Other | 114,003 |

*Mexico*

According to the 1930 Population Census, of 5.2 million persons in the labor force, 3.6 million (70 percent) were employed in agriculture and related industries, and 0.7 million (14.4 percent) in manufacturing and mining. Value of production figures, except for 'other agricultural

products', were taken from the *Anuario Estadistico de los Estados Unidos Mexicanos*, 1940. The value of 'other agricultural products' was estimated on the basis of acreage not covered by the most important products listed in the official production data. The value of manufacturing production for 1940 was computed by raising the 1935 Census value, 988.9 million pesos, 40 percent, the change in the index of the value of manufacturing between 1935 and 1940 (Table E).

### TABLE E
### Mexico
### Agricultural, Mineral, and Manufacturing Production, Total Value, 1940

| | MILLIONS OF PESOS |
|---|---|
| Agriculture | 1,409.0 |
| Most important products (1939) | 733.0 |
| Other products (estimated) | 450.0 |
| Forestry (1937) | 47.1 |
| Fishing (70.5 million kgs. at 27 cts. per kg.) | 19.0 |
| Cattle, hogs, sheep, and other | 159.9 |
| Mining | 846.8 |
| Metals | 645.2 |
| Coal | 16.3 |
| Petroleum | 185.3 |
| Manufacturing | 1,384.0 |
| Total | 3,639.8 |

### TABLE 44
### Twenty-two American Countries
### National Income

| | YEAR | POPULATION (thousands) | NATIONAL INCOME [a] | PER CAPITA INCOME [b] |
|---|---|---|---|---|
| United States [c] | 1940 | 131,669 | 77,574 | 589 |
| Canada [d] | 1940 | 11,381 | 5,404 | 475 |
| Mexico | 1940 | 19,474 | 3,144 | 161 |
| Costa Rica | 1939 | 607 | | |
| El Salvador | 1940 | 1,788 | 111 | 62 |
| Guatemala | 1939 | 3,002 | | |
| Honduras | 1941–42 | 1,108 | 77 | 69 |
| Nicaragua | 1940 | 994 | | |
| Panama | 1942 | 567 | 79 | 139 |
| Cuba | 1942 | 4,232 | 651 | 154 |
| Dominican Republic | 1940 | 1,650 | 70 | 42 |
| Haiti | 1939 | 2,600 | | |
| Argentina | 1940 | 13,321 | 7,936 | 596 |
| Bolivia | 1940 | 3,100 | 7,350 | 2,371 |
| Brazil | 1940 | 41,565 | 33,111 | 797 |
| Ecuador | 1942 | 3,000 | 1,500 | 500 |
| Colombia | 1940 | 9,100 | 1,098 | 121 |
| Chile | 1940 | 4,750 | 12,953 | 2,727 |

TABLE 44 (*Continued*)

| | | | | |
|---|---|---|---|---|
| Paraguay | 1940 | 1,015 | 84 | 83 |
| Peru | 1940 | 6,028 | 2,043 | 339 |
| Uruguay | 1940 | 2,170 | 436 | 201 |
| Venezuela | 1936 | 3,364 | 1,097 | 326 |

[a] In millions of each national currency.
[b] In units of each national currency.
[c] Estimate of the Department of Commerce, *Survey of Current Business*, April 1945, p. 15.
[d] *Canada Yearbook, 1943–44*, p. 797. Adjusted for interest and dividends transferred abroad.

## 3 INTERNATIONAL COMPARISONS OF NATIONAL INCOME

Comparing levels of national income in real terms in two periods or between countries is one of the most difficult tasks an economist or statistician encounters, for it is impossible to avoid the welfare concepts which, explicitly or implicitly, always enter into the analysis.

Basically the measurement of real national income or its changes is equivalent to measuring 'per capita productivity'. Were it possible to determine that the average productivity — as measured by the commodities and services produced per employed person — of two countries is the same, it could be asserted that, irrespective of their money national income, their real per capita incomes would be equal and their aggregate real national incomes would be in direct relation to the size of their populations. However, because of environmental, social, and natural conditions, technical skill, and utilization of machinery in varying degrees, the economic productivity of two nations may be quite different. Moreover, the output of each country is made up of commodities that often differ in quality or lack a counterpart in other countries. England may enjoy a high productivity in the textile industry while the United States may be favored with respect to the costs of producing automobiles. The average productivity of England and the United States can at best probably be calculated only roughly.

Since the object of all economic activity is to provide consumers with commodities and services to satisfy their basic needs, an obvious way of measuring the 'productivity' of a system is to measure the degree to which the basic needs of the population are met. National income, although of necessity in terms of a common unit of value — the national currency — actually represents assortments of commodities produced and

services rendered during specific periods and hence are expressions of economic welfare. For this reason, national income figures have, at least for the individuals to whom a part of this income flows, a more or less definite meaning in real terms, i.e., in terms of actual commodities and services offered on the market. Such subjective judgments of the real equivalence of a given money income vary, nevertheless, with income brackets, tastes, habits, social status, etc., of individuals and, even for individuals similarly placed, with geographical areas within a country. Consequently there is no unique appraisal of the real meaning of a given money income, but rather there are as many as there are groups of individuals.

The real income of a country can be visualized also as a schedule showing each individual commodity and service item created, and the quantities produced during two periods or in two areas can be evaluated according to one set of prices. If all the items constituting the output in the two areas or periods are of the same nature and quality, even though the quantities produced may have varied, the money aggregates will express the changes in real income, provided the distribution of the purchasing power among households and individuals as well as their tastes and preferences have remained constant. Another implicit assumption — that prices reflect the economic value of each good in the schedule — introduces the first theoretical difficulty. As prices of different goods change in different proportions, the results will differ according to whether prices prevailing at the beginning or end of the period — or in one area or the other — are used.

The above conditions — equality in the distribution of purchasing power and constancy in the tastes and preferences of individuals — are ideal and never found in actual experience. Moreover, concepts such as preferences and tastes cannot be measured statistically. Even data on income distribution are scarce and seldom available for several successive periods. In addition, it is impracticable to measure in the form expressed above each and every one of the many items in the schedule.

These difficulties hamper even measurements for short periods and areas not far apart within a country. They increase out of all proportion when the problem is to compare incomes in two widely separated periods or in two totally different areas.

A North American is interested in knowing the national income of the various Latin American countries expressed in dollars — the only currency which for him has a definite meaning in terms of commodities and services. The basket of goods bought by North Americans is, nevertheless, different from that bought, for example, by Brazilians or Panamanians. Tastes and habits differ widely; natural conditions in the various countries are such that goods readily and cheaply available in the United States are rarities or delicacies in Latin America, and vice versa. Comforts such as central heating, absolute necessities in the North, are not even thought of in the South. Clothing, buildings, transportation, almost everything is subject to regional differentiation which prevents any sort of accurate inter-country comparison of national incomes or standards of living.

A. C. Pigou analyzes in detail the theoretical and practical difficulties of comparing changes in the size of the real dividend between two periods within one country and concludes that parallelism is unattainable.[45] A possible solution, based upon the hypothesis of similarity of production and rigidity in tastes and income distribution, is given by a formula in which the ratio of the aggregates of the money incomes in each period is multiplied by a factor representing a geometric average of the reciprocal of the price changes, weighted first by the quantities bought in the first period, then by those in the second period. Of course, in practice, only a sample of the prices of the various commodities and services in each broad group can be obtained, so that the weights to be assigned to these items must be representative of those of the group to which each item belongs.

Colin Clark adapts the above suggestion to solve the problem of comparing national incomes.[46] The assumptions on which Professor Pigou's solution rests are such, however, that approximate results can be obtained only when the economic structures of the countries whose incomes are being compared are very similar. It obviously does not apply as well to countries

[45] *Economics of Welfare* (Macmillan, London, 1933, 4th ed.)

[46] *The Conditions of Economic Progress*, Introduction and Ch. 1.

Clark's estimates of real income for undeveloped countries are only rough approximations. He writes: "We shall probably be able to get results within the range of 10–20 percent actuality if we estimate that the purchasing power of money in the less economically developed parts of the world for which records are lacking is given by a price index number in the neighborhood of 66 (U. S. A. = 100) . . . " (*ibid.*, p. 52).

where living conditions, the distribution of income, and consumers' tastes are utterly different and where the finding of a sufficiently large number of commodities representative of the production of each country and still comparable among themselves is practically impossible. As the majority of the Latin American countries are, in all the above respects as well as in climate and other natural conditions, far removed from Europe or the United States, the results, even if based upon a large sample of commodities and careful selection of prices, would quite likely be suspect. In addition, owing to the differences in habits and diets already pointed out, the evaluation of, say, an American budget at prices prevailing in Bolivia would probably yield an abnormally high cost in Bolivian pesos. Similarly, a Bolivian budget at prices prevailing in the United States would probably yield an abnormally high cost in American dollars. For this reason, the averaging of the cost of an American budget at foreign prices with that of a foreign budget at American prices, however made, will be completely arbitrary if living conditions differ radically. Such a solution can be accepted only if there is no better method. One difficulty is that the few cost of living and consumption studies for Latin American cities are in general too limited in scope, and in no case is it possible to place the families investigated within the general economic and social framework of the community as a whole so as to determine how representative the group is. For example, it seems impossible to say what type of family or what level of income in Ecuador can be considered under national conditions to be the equivalent of a given income level in Caracas, Buenos Aires, or New York.[47]

### A *Computation of Purchasing Power Parities*

Despite the shortcomings inherent in any method of comparing national incomes, an attempt has been made to compute the purchasing power of the currencies of the countries in the

[47] Adequacy of the diet could perhaps be used as a criterion. Customs and habits, nevertheless, play an important role, and in reality the diet is a function not only of the income level but also of education and habit. For instance, the studies of family income and expenditures undertaken in the United States (see *Miscellaneous Publication 465*, U. S. Department of Agriculture, p. 59) show that among non-farm communities 16 percent of the families in the \$1,500–\$1,999 and \$2,000–\$2,999 income groups had 'poor' diets. Of the families above the \$3,000 level, 10 percent also had 'poor' diets.

Western Hemisphere in terms of a given basket of goods. To this end, twelve important food items consumed by an adult in

TABLE 45
Six United States Cities, 1940
Average Consumption and Cost of Twelve Important Food Items

| | UNIT | QUANTITIES CONSUMED | PRICE * (U. S. cents) | COST (U. S. $) |
|---|---|---|---|---|
| Wheat bread | Kgs | 40.2 | 17.4 | 6.99 |
| Wheat flour | Kgs. | 14.9 | 9.0 | 1.34 |
| Rice | Kgs. | 2.2 | 17.4 | 0.38 |
| Beef, fresh | Kgs. | 24.3 | 52.2 | 12.68 |
| Pork, fresh | Kgs. | 6.9 | 68.6 | 4.73 |
| Milk | Kgs. | 152.1 | 13.0 | 19.77 |
| Butter | Kgs. | 11.9 | 81.7 | 9.72 |
| Cheese | Kgs. | 4.4 | 57.9 | 2.55 |
| Eggs | No. | 326.0 | 3.1 | 10.11 |
| Potatoes | Kgs. | 88.9 | 4.5 | 4.00 |
| Sugar | Kgs. | 31.6 | 11.3 | 3.57 |
| Coffee | Kgs. | 5.7 | 47.6 | 2.71 |
| Aggregate | | | | 78.55 |

Based on average consumption per 'consumption unit' (adult male) per year, according to surveys by the U. S. Department of Labor (*Yearbook of Labour Statistics, 1941;* International Labour Office), p. 170.

* Retail prices in eight cities (*ibid.*, p. 159).

TABLE 46
Fifteen American Countries
Aggregate Cost of Buying Given Quantities of
Twelve Important Food Items, 1940
(units of national currencies)

| | | |
|---|---|---|
| United States | Dollars | 78.55 |
| Uruguay | Pesos | 61.29 [a] |
| Cuba | Pesos | 63.64 |
| Canada | Dollars | 71.05 |
| Dominican Republic | Pesos | 77.86 |
| El Salvador | Colones | 90.88 [b] |
| Paraguay | Guaranies | 99.56 [c] |
| Colombia | Pesos | 103.08 |
| Argentina | Pesos | 114.28 [a] |
| Mexico | Pesos | 205.29 |
| Peru | Soles | 272.53 |
| Venezuela | Bolivares | 480.29 |
| Brazil | Cruzeiros | 713.15 [d] |
| Chile | Pesos | 1,341.04 |
| Bolivia | Bolivianos | 3,201.28 |

Prices, whenever possible, are for not one city but several, so that they are representative of the country as a whole. In Peru, Uruguay, Cuba, Colombia, Chile, Bolivia, and Venezuela they are for the respective capital cities where prices are usually higher. As in Caracas, Venezuela especially, prices are relatively much higher than in other capital cities, the comparison with Venezuela should be disregarded.

[a] Excludes pork and butter. The comparable American budget costs $64.10.

[b] Excludes wheat bread. The comparable American budget costs $71.56.

[c] Excludes wheat bread and pork. The comparable American budget costs $66.70.

[d] Excludes pork and cheese. The comparable American budget costs $71.27.

the United States were selected and the quantities valued at the retail prices prevailing in each country (Tables 45 and 46). The only possible justification for the method lies in the fact that the products selected are standardized and figure in the average diets in all fifteen countries. If these products in any way measure or represent the relative prices of all other food products consumed — which is probably the case — the results will most likely constitute a definite improvement upon foreign exchange rates, the usual base.[48] The budget or 'basket' has been confined to food items since it was impossible to find adequate comparable quantity and price data for clothing items or shelter, the inclusion of which would also have been desirable. By relating the cost of the basket in United States dollars to that in other national currencies, an approximation to the various purchasing power parities is obtained. Table 47 compares the value of one unit of each foreign currency in dollars, calcu-

TABLE 47

'Purchasing Power Parities' and Exchange Rates
Seventeen American Currencies, 1940
(United States dollars per unit of foreign currency)

| | CURRENCY | PURCHASING POWER PARITY | EXCHANGE RATE |
|---|---|---|---|
| Argentina | Peso | $0.56 | $0.23 |
| Bolivia | Boliviano | 0.02 | 0.02 |
| Brazil | Cruzeiro | 0.10 | 0.05 |
| Canada | Dollar | 1.11 | 0.85 |
| Chile | Peso | 0.06 | 0.03 |
| Cuba | Peso | 1.23 | 0.90 |
| Colombia | Peso | 0.76 | 0.57 |
| Dominican Republic | Peso | 0.92 | 1.00 |
| El Salvador | Colon | 0.79 | 0.40 |
| Mexico | Peso | 0.35 | 0.19 |
| Paraguay | Guarani | 0.67 | 0.30 |
| Peru | Sol | 0.29 | 0.16 |
| Uruguay | Peso | 1.04 | 0.38 |
| Venezuela | Bolivar | 0.16 | 0.30 |
| Panama | Balboa | | 1.00 |
| Honduras | Lempira | | 0.50 |
| Ecuador | Sucre | | 0.06 |

[48] Exchange rates, in the absence of foreign exchange or foreign trade controls, tend to move with the ratio of the price indexes of the commodities entering the foreign trade of the respective countries. There may nevertheless be a wide gap between the price levels of the commodities entering foreign trade and those consumed in home markets, so that even in the absence of foreign exchange and foreign trade restrictions, the movements of exchange rates and those of the general 'price level' will not coincide. For these reasons, even crudely computed purchasing power parities are better than the exchange rate.

lated in this fashion, with the average exchange rates prevailing in the free markets during 1940.

Despite their crudeness, the 'purchasing power parities' show rather well the relative value of each currency in terms of commodities, except perhaps for Venezuela, where, as stated in the note to Table 46, the retail prices used, for Caracas, are well above the levels in other parts of the country.

## B *Real Income of Latin America*

Before applying the 'purchasing power parities', it may be well to sound a warning regarding certain factors that affect their comparability, among them that due to internal differences in the purchasing power of money in each country.

As has been shown, in many of the countries the majority of the inhabitants live in rural areas and a good proportion of production never reaches the market; i.e., is not bought or sold. Still, for the purpose of computing national income, a monetary value — usually based on the prices paid for the portion of production that is marketed and for which there are prices — is attributed to it. The net contribution of agriculture is then estimated at theoretical values at the farm or point of production. This theoretical money income, the greater part of which is made up of food items produced and consumed on the farm, is not comparable with the money income of urban workers spent on similar consumption items whose cost is affected by transportation, profits of middlemen, and other charges entailed in bringing them from the farms to consumption centers. Thus, in estimating the national income originating in agriculture, a definite downward bias is introduced, as is evident for several countries for which figures are available. A good example is Venezuela where money income per person employed in agricultural pursuits did not seem to exceed 600 bolivars in 1936, while income per person employed in manufacturing and trade reached 2,000 and 3,000 bolivars respectively. Even within the same economic groups, variations in income are considerable, depending on the area. Average earnings of workers employed in trade in the State of Zulia in Venezuela were 5.67 bolivars a day, whereas in Nueva Esparta they did not exceed 1.21 bolivars. Similar ranges characterize office employees, not only in trade but also in manufacturing and service industries.

Real income does not show equivalent disparities, although price data do not give a true picture.

International comparisons of the national incomes of countries largely dependent upon agriculture are complicated, because in more industrialized countries the regional variations of per capita income are not nearly as pronounced. Furthermore, a balancing item is afforded in the latter type of country by the fact that the prices of manufactured products consumed in rural areas — in relatively larger quantities than in Latin America — are higher than in urban zones because of additional transportation charges.

Other reasons why attempts to compare national incomes should be viewed with extreme caution are the geographical differences affecting living conditions already mentioned. Rent paid or imputed, for instance, constitutes a higher proportion of total United States income than of those of most tropical countries where a majority of the natives live in improvised or in any case very inexpensive shelters. The absence of roofs on houses in southern Peru near the Atacama Desert does not mean — other things being equal — that the houses are poorer than those in the United States. As it never rains in the area roofs are superfluous and would be a nuisance in that they would keep the temperature in the houses unduly high. Clothing is lighter and many items entering the national income of the United States are not used in some South American countries. This means that conditions are simply different, not worse. All the above factors tend to give any comparison of Latin America–United States national income a bias unfavorable to Latin America, with perhaps the exception of Argentina, Chile, and Uruguay where living conditions approximate those of the United States more closely.

The relative smallness of the national incomes of Latin American countries is the most striking feature of Table 48. Although some of the figures may be questioned and subject to the margins of error already stressed, it is doubtful that on the whole the picture is excessively distorted. With a population of 124 million in 1940 Latin America had a national income only one-sixth that of the United States. Argentine national income is one-third that of all Latin America, followed by Brazil with $3,311 million or one-fourth. Nearly 45 percent of the total population of Latin America live in these two countries.

### Table 48

### Twenty-two American Countries

### Total and Per Capita National Incomes, 1940

| | Total National Income (national currency 000,000) | Purchasing Power Parity ($) | National Income (comparable $000,000) | Population (000's) | Per Capita Income (comparable $) | Income % Distribution |
|---|---|---|---|---|---|---|
| Western Hemisphere | . . | . | 96,830 | 267,049 | 362 | 100.0 |
| United States | 77,574 | 1.00 | 77,574 | 131,669 | 589 | 80.1 |
| Canada | 5,404 | 1.11 | 5,998 | 11,381 | 527 | 6.2 |
| Latin America | . . | . . . | 13,258 | 123,999 | 106 | 13.7 |
| Argentina | 7,936 | 0.56 | 4,444 | 13,321 | 334 | 33.4 |
| Uruguay | 436 | 1.04 | 453 | 2,170 | 209 | 3.4 |
| Chile | 12,953 | 0.06 | 777 | 4,750 | 164 | 5.9 |
| Cuba | 488 [a] | 1.23 | 600 | 4,200 | 143 | 4.6 |
| Panama | 79 [b] | 1.00 [c] | 79 | 567 | 139 | 0.6 |
| Peru | 2,043 | 0.29 | 592 | 6,208 | 95 | |
| Colombia | 1,098 | 0.76 | 834 | 9,100 | 92 | 6.3 |
| Venezuela | 1.150 [d] | 0.30 [c] | 345 | 3,780 | 91 | 2.6 |
| Brazil | 33,111 | 0.10 | 3,311 | 41,565 | 80 | 25.0 |
| Mexico | 3,144 | 0.35 | 1,100 | 19,474 | 56 | 8.3 |
| Paraguay | 84 | 0.67 | 56 | 1,015 | 55 | 0.4 |
| El Salvador | 111 | 0.79 | 87 | 1,788 | 49 | 0.7 |
| Bolivia | 7,350 | 0.02 | 147 | 3,100 | 47 | 1.1 |
| Dominican Republic | 70 | 0.92 | 64 | 1,650 | 39 | 0.5 |
| Honduras | 77 [e] | 0.50 [c] | 39 | 1,108 | 35 | 0.3 |
| Ecuador | 1,500 [f] | 0.06 [c] | 90 | 3,000 | 30 | 0.7 |
| Guatemala, Nicaragua, Costa Rica, & Haiti | . . . | . . . | 241 [g] | 7,203 | . . . | 6.3 |

[a] Estimated by applying to the 1942 figures an index of total merchandise sales; see *Cuba Económica y Financiera*, Jan. 1945, p. 27.

[b] For 1942. It does not seem possible to estimate for 1940.

[c] Converted into dollars by means of exchange rates. No retail prices available.

[d] The 1940 figure was estimated by assuming no changes in production and increasing the 1936 estimate 5 percent, or the equivalent change in wholesale prices.

[e] 1941–42. It does not seem possible to estimate for 1940.

[f] The original estimate seems to be for 1942.

[g] Rough estimate on the assumption that the per capita incomes (in comparable dollars) of Guatemala, Nicaragua, Costa Rica, and Haiti are similar to the average of those of Honduras, El Salvador, and the Dominican Republic.

Another possible way of obtaining an approximate idea of the welfare level in various countries is by indirect indexes such as automobiles, refrigerators, radios, and other consumer goods; the number of letters mailed or of telephones per inhabitant; the railroad mileage or even the degree of literacy. This procedure, though practical and relatively simple, sometimes gives different answers according to the type of index selected. Furthermore, there is no way of knowing what relative importance each index has in determining national welfare, so that weighting, if adopted, would be arbitrary. Still, and chiefly for its curiosity value, Table 49 gives per capita data for some of the

TABLE 49

Twenty-two American Countries

Six Indexes of Economic Welfare

| | RR. MILEAGE | ROADS | AUTOS | TEL. | RADIOS | % OF ILLITERACY |
|---|---|---|---|---|---|---|
| | (Per thousand inhabitants) | | | | | |
| United States | 3.24 | 22.78 [a] | 261.13 | 147.74 | | 4.3 |
| Canada | 4.92 | 48.71 | 130.52 | 127.04 | 126.50 | 3.7 |
| Argentina | 2.06 | 19.00 | 23.23 | 34.60 | 78.82 | 12 |
| Uruguay | 0.87 | 10.39 | 21.15 | 21.56 [b] | 69.32 | 20 |
| Chile | 1.09 | 4.76 | 10.58 | 19.15 | 42.10 | 24 |
| Cuba | 1.42 [c] | 0.52 | 11.07 | 16.20 | 47.30 [d] | 60 |
| Mexico | 0.66 | 2.93 | 5.43 [e] | 9.21 | 18.03 | 45 |
| Brazil | 0.51 | 3.10 | 4.18 | 7.00 | 12.03 | 70 |
| Costa Rica | 0.28 | 0.60 | 5.87 | 6.02 | 32.74 | 32 |
| Venezuela | 0.21 | 1.49 | 8.99 | 8.06 | 34.93 | 75 |
| Paraguay | 1.03 | 3.70 | 1.41 | 3.74 | 12.32 | 75 |
| Panama | 0.61 [f] | 1.40 [f] | 24.35 [f] | 11.24 | 51.36 | 60 |
| Colombia | 0.22 | 1.58 | 3.89 | 4.64 | 18.24 | 39 |
| Bolivia | 0.45 | 3.28 | 1.85 | 0.85 | 12.90 | 80 |
| Peru | 0.38 | 2.67 | 3.96 | 5.66 | 11.28 | 70 |
| Honduras | 0.60 | 0.63 | 1.42 | 1.73 [e] | 14.44 | 82 |
| El Salvador | 0.21 | 2.07 | 1.91 | 2.09 [g] | 5.87 | 55 |
| Dominican Republic | 0.48 | 1.32 | 1.67 | 1.48 [h] | 6.18 [d] | 60 |
| Nicaragua | 0.30 | 1.59 | 0.93 | 1.55 [i] | 4.11 | 70 |
| Ecuador | 0.27 | 1.10 | 1.30 | 2.53 | 2.27 | 75 |
| Guatemala | 0.21 | 1.15 | 1.30 | 1.16 | 6.70 | 75 |
| Haiti | 0.06 | 0.59 | 0.96 | 1.12 [i] | 1.92 [d] | 75 |

Original data on railroads, roads, automobiles, telephones, and radios — except for a few changes to correct obvious errors — are from *Overseas Air Service Pattern* (Civil Aeronautics Board, Washington, D. C., 1944), pp. 107–8.

Illiteracy percentages are from *Educacion Primaria* (Ministerio de Educacion Nacional, Republica de Colombia, Bogota, 1944). Figures for the United States and Canada are from the *Statistical Abstract, 1942*, and *The Canada Yearbook, 1942*, respectively. All figures except those for railroad mileage, which are for 1940, are for 1941.

[a] Based on 1930 figures.
[b] 1939.
[c] L. V. Abad, *Problemas de los Transportes Cubanos* (Havana, 1944).
[d] 1943.
[e] 1940.
[f] Including the Canal Zone.
[g] 1938.
[h] 1936.
[i] 1942.

indexes mentioned above for the twenty-two American countries. Listed by the approximate level of their economic welfare (based on simple visual observation of the indexes), the countries are in general in an order similar to that of Table 48.

## Part IV

# Savings and the Income Distribution

DOROTHY S. BRADY
*Bureau of Labor Statistics*
AND
ROSE D. FRIEDMAN

# Resource Distribution Patterns and the Classification of Families

WILLIAM VICKREY
*Columbia University*

## *COMMENT*

SIMON KUZNETS
*University of Pennsylvania*

ALICE C. HANSON
*Bureau of the Budget*

MARGARET G. REID
*Bureau of Human Nutrition and Home Economics*

JEROME CORNFIELD
*Bureau of Labor Statistics*

## *REPLY*

MR. VICKREY

# SAVINGS AND THE INCOME DISTRIBUTION

DOROTHY S. BRADY

AND

ROSE D. FRIEDMAN

STUDIES OF FAMILY EXPENDITURES and savings have hitherto sought explanations of variability in terms of the income of the individual family, its size, occupational group, race and national origin, region and size of community. The variation in consumption patterns among families in different sections of the country has been called a regional difference and was left as not yet susceptible of expression in a numerical relation of any form. Differences in consumption patterns at given income levels at different dates have similarly been treated as due to changes in consumer attitudes and preferences. It is true that in both comparisons some thought has been given to the possibility of isolating the effect of variations in the price level. Price level is, however, only one of potentially measurable factors that make for differences between different communities at the same time or in the same community at different times. Among the other characteristics of communities that can be expressed in quantitative terms, the level and distribution of income may be assumed to be the most important. The purpose of this paper is to indicate that variations in the pattern of consumption and savings among groups of families at given income levels may be explained to a considerable degree by differences in the level and distribution of income.

The savings pattern, namely, the percentage of income saved at each income level, has been related to the income distribution for all the recent sample surveys that provided data on both savings and income distribution. The association of the savings pattern with the income distribution shows that income distribution is an important determinant of the proportion of the income at each income level that is allocated to savings.

In general, the smaller the percentage of families in the higher income brackets, the greater the percentage of income saved at each income level. Among groups of nonfarm families, in different areas or at not widely separated periods, the percentage of income saved appears to approach a common value at the same relative income position; that is, at the same decile or percentile of income. Among farm groups there is likewise a tendency for the percentage of income allocated to savings in different areas or at different times to differ less at the same relative position than at the same absolute point on the income scale. The ratio of savings to income is, however, uniformly higher among farm than among nonfarm families whether the comparison is based on the dollar income or the relative income position.

The savings pattern is altered, however, by changes in the size of the consumer unit. All the available studies of savings patterns by income and size of family show that for families of a given type in a given community the percentage of income saved is higher at the higher income levels at any given point in time. But at a given income level savings decrease with increases in the size of the family. Accordingly, savings related to either the absolute income or the relative income position are higher when the average size of the family is smaller.

A tendency toward a stable relation between the percentage of income saved and the relative income position among families of the same size implies that raising the general level of income in a community has the effect of increasing the expenditures and decreasing the savings of families at every level. A general shift to higher incomes would not effect as great an increase in total savings as would be expected on the basis of the pattern of savings in relation to income that was characteristic of a period when incomes in general were low. To the extent that any such changes are not offset by price increases, the increase in the demand for goods accompanying a general rise in income would exceed any predictions based on the earlier consumption patterns.

To explore the relation between savings, income, and income distribution more fully, existing data should be analyzed and new collections planned to extend our knowledge of the influence of many factors in quantitative terms. In a given community, changes in the income situation are likely to be associ-

ated with changes in occupational groupings, in the average size of family, and in the price level. From time to time such composites as all urban communities change with respect to the same factors, and in addition to the regional distribution of the population.

The difference between the savings pattern of farm and non-farm families suggests a difference between entrepreneurial non-farm families and the wage and salary group. That survey data do not reveal a consistent difference between these groups in the pattern of expenditures and savings is probably due to inaccuracies of the enumeration methods in the case of the non-farm entrepreneurial group. Probably most reports on the income of this group are, in reality, an estimate of withdrawals, so that both income and business savings are subject to a large biased error. Such an error inevitably alters the form of the savings pattern. The development of more precise information about this group would require extensive experimentation with procedures differing considerably from those used in the past.

Family size has always been recognized as an important determinant of expenditures and savings. Nevertheless, it is impossible to carry through the various expenditure studies a comparison of families of the same type or size. The reports on some surveys have presented no data for family size groups and no consistent mode of classification is found in the reports of the surveys that included tabulations by size or type of family. Enough information is available, however, to make possible the development of a procedure for eliminating the influence of family size from the data for all types of family. Work in progress at the Bureau of Labor Statistics indicates that there is sufficient stability in the relative differences among families differing in size to provide a method for converting the data from various studies to a common base with respect to family size.

Two income situations would lead to a difference in the average size of family at each income level even though the average size of family in the total population were the same. Furthermore, it is doubtless true that higher incomes usually lead to more and smaller families, as consumer units. Unless it is possible to foresee large enough collections of data to provide for separate tables for each size of family, the approach to this

problem must necessarily be via some analytical procedures. For estimating the aggregate effect of alterations in the savings pattern, data on the distribution of the population in consumer units of different size is absolutely essential.

Changes in the savings pattern in relation to absolute income from one income situation to another may occur in stepwise fashion. To ascertain the nature of the lags that probably exist, data on the expenditures and savings of families in the same area need to be collected for a considerable period. Such comparisons as it is possible to make at present are confined to large groups of communities or are hampered by significant differences in the coverage and designs of the surveys and the methods of tabulation. Nevertheless, some indications of the nature of the changes in the savings and expenditure patterns could be read from existing data through more intensive analysis. In plans for future surveys serious consideration should be given to the provision of data for separate communities that were covered at earlier dates.

Existing data provide a much better basis than is ordinarily recognized for explaining the influence of price changes on the pattern of expenditures and savings. So far as price and income levels are positively correlated, changes in the savings pattern in terms of absolute income toward stability in terms of relative income may be largely a matter of price differences. Preliminary investigations have revealed that price differences are only a partial explanation of the apparent tendency for families, whatever their income, to relate their consumption to the community income situation.

## 1 Savings Pattern

In all studies of family expenditures in relation to current income the pattern of savings exhibits the same general characteristics. From average dissavings in the lowest income brackets there is a progression to rapidly increasing average net savings in the highest income brackets. Notable variations in the pattern of savings among groups of families appear, however, in the data from various surveys.

During the last century and a half there have been many studies of family expenditures.[1] Before the first large scale

[1] Williams and Zimmerman, *Studies of Family Living in the United States and Other Countries* (Department of Agriculture, Misc. Bul. 223, 1935).

studies undertaken by the Department of Labor, information on income was seldom obtained and used in tabulating expenditure. In the two studies made by the Department of Labor in 1888 and 1901, income was entered on the schedule, and in the second, expenditures by income brackets were tabulated for many groups of families.[2] Net savings by income bracket were not, however, given in the published report but can be calculated as the difference between income and expenditures. In the report of the 1918–19 survey the basic tables show savings by income bracket, calculated as the difference between income and reported total expenditures.[3] The absence of data on income and expenditures in family budget studies was so common that Allen and Bowley, in their analysis of variations in family expenditures, found it necessary to use total expenditures in lieu of income.[4]

The first large studies to obtain direct estimates of savings were made in 1934–36 — the Study of Money Disbursements of Wage Earners and Lower Salaried Clerical Workers, 1934–36, and the Consumer Purchases Study, 1935–36. A section of the schedule in each of these studies was devoted to reports on the changes during the year in itemized lists of assets and liabilities. Total savings or dissavings and the details of the changes in specified assets and liabilities were tabulated for all sample areas.[5] Estimates of savings by income bracket were developed from data for the sample areas for all American families and single individuals and for families in the different regions and in different sizes of community.[6] In 1942 a similar study of a small sample of American families and single consumers was

[2] *Seventh Annual Report of the Commissioner of Labor, 1891* and *Eighteenth Annual Report of the Commissioner of Labor, 1901–2* (Department of Labor).

[3] *Cost of Living in the United States* (Bureau of Labor Statistics, Bul. 357, May 1924).

[4] *Family Expenditure, A Study of Its Variation* (London, 1935).

[5] *Family Expenditures in Selected Cities, 1935–36*, Bul. 648, Vol. VIII, Study of Consumer Purchases: Urban Technical Series (Bureau of Labor Statistics); *Changes in Assets and Liabilities of Families*, Five Regions, Urban, Village, Farm (Department of Agriculture, Misc. Publication 464, March 1942); *Money Disbursements of Wage Earners and Clerical Workers, 1934–36, Summary Volume* (Bureau of Labor Statistics, Bul. 638, 1941).

[6] *Consumer Expenditures in the United States*, Estimates for 1935–36 (National Resources Committee, 1939); *Family Expenditures in the United States*, Statistical Tables and Appendixes (National Resources Committee Publication released by the National Resources Planning Board, 1941).

made. It provided estimates of savings by income bracket for all urban, all rural nonfarm, and all farm families, and single consumers.[7] Thus, only in recent years have comprehensive data on the relation of savings to income been collected and made available for analysis through publication.

The Consumer Purchases Study, 1935–36, and the Study of Spending and Saving in Wartime, 1941–42, showed that farm families save more than village families and village families more than urban families at the same absolute level of current income, whether total income (money and nonmoney) or simply money income is used as the basis of comparison. In some regions savings were higher among village families than among small urban families at the same income level, in others the savings patterns were practically the same. Similarly, only in part of the regions did a difference appear in the savings of small urban families compared with families in middle-sized and large cities at the same income level. Savings of families in New York and Chicago were, however, lower than those of comparable families in smaller communities in any region. The following comparisons indicate that in general where there was a difference in the savings pattern between communities of different sizes in the same region, there were significant differences in the level and distribution of income; where no difference appeared in the relation of savings to income, the income distributions in the community groups were similar.

## 2 Savings of Different Population Groups, 1935–1936

The association between savings and income distribution is obvious in the summarized data for three broad population groups from the Consumer Purchases Study (Table 1). The general income level was lower in farm areas than in villages and lower in villages than in cities. Savings at each income bracket were higher in farm areas than in villages and higher in villages than in cities. Comparison of the data for villages and for cities reveals that among both groups of families the percentage saved at the 9th decile was about 12 percent, at the

[7] *Spending and Saving of the Nation's Families in Wartime* (Bureau of Labor Statistics, Bul. 723, 1943); *Income and Spending and Saving of City Families in Wartime* (Bul. 724, 1943); *Rural Family Spending and Saving in Wartime* (Department of Agriculture, Misc. Publication 520, June 1943).

TABLE 1

Rural-Urban Differences in Family Savings

Distribution of Families in Three Types of Community by Income and the Percentage of Income devoted to Savings by Income Group

| INCOME GROUP | INCOME DISTRIBUTION (CUMULATED) | | | SAVINGS AS A % OF MONEY INCOME | | |
|---|---|---|---|---|---|---|
| | Farms | Villages | Cities | Farms | Villages | Cities |
| Under $1,000* | 100.0 | 100.0 | 100.0 | deficit | | |
| 1,000– 1,250 | 43.4 | 49.9 | 60.9 | –.9 | –.9 | –3.7 |
| 1,250– 1,500 | 31.7 | 38.6 | 50.1 | 5.7 | 1.0 | –.9 |
| 1,500– 1,750 | 22.8 | 29.2 | 40.9 | 11.0 | 3.2 | .3 |
| 1,750– 2,000 | 16.4 | 21.9 | 32.6 | 15.8 | 4.3 | 2.0 |
| 2,000– 2,500 | 12.0 | 16.7 | 25.3 | 20.8 | 8.5 | 5.3 |
| 2,500– 3,000 | 6.9 | 9.9 | 15.6 | 28.6 | 11.4 | 8.5 |
| 3,000– 4,000 | 4.3 | 6.3 | 10.2 | 34.4 | 14.5 | 12.7 |
| 4,000– 5,000 | 1.9 | 3.4 | 5.1 | 43.3 | 22.1 | 15.6 |
| 5,000–10,000 | 1.2 | 2.3 | 3.4 | 52.6 | 37.7 | 20.5 |
| Average | 1,215 | 1,409 | 1,855 | 11.4 | 11.0 | 9.5 |

*Family Expenditures in the United States*, Statistical Tables and Appendixes (National Resources Planning Board, 1941).

* Includes all families receiving some relief.

95th percentile about 15 percent, and at the 97th percentile about 20 percent. Savings among farm families were, however, higher than among nonfarm families of the same relative income position.

The correspondence between savings and income distribution in the case of urban and village families appears when finer population groupings are considered. Chart 1, based on data for families in villages and cities of various size ranges, shows that a large part of the variation in savings is eliminated by comparing families at the same relative income level. The size of family did not differ enough among the various groups to account for the differences remaining. The apparent systematic deviations of the large city and metropolitan groups from the general pattern can be considered as arising from variations in the relative accuracy of the data on income distribution.

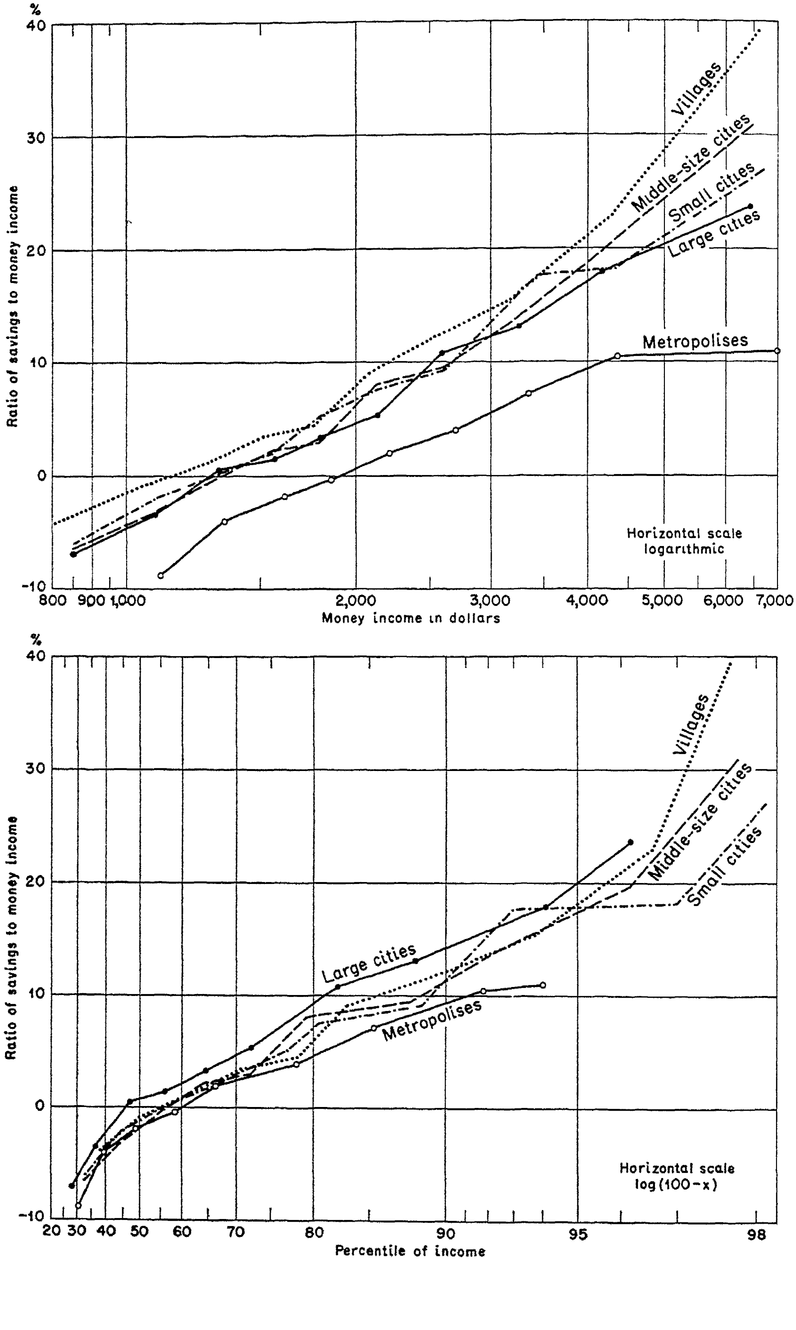
Income distributions based on survey data are now known to be subject to biases of two kinds. First, there is a tendency toward underestimations of the frequency in the higher income brackets; second, reports at all income levels tend to be understatements.[8] The income distributions used in displaying this association were adjusted for the first type of error.[9] The ad-

[8] *Family Spending and Saving in Wartime* (Bureau of Labor Statistics, Bul. 822, in press).

[9] *Consumer Incomes in the United States* (National Resources Committee, 1938), App. A.

Chart 1

## Savings of Nonfarm Families in Relation to Income and Income Distribution 1935–1936



justment of basic survey samples involved some arbitrary assumptions and the effect of the second type of error in survey data could not be measured. Accordingly, the deviation of any one group from the general rule may be almost entirely due to a relatively less accurate estimate of the income distribution.

As shown in Chart 2, the general relation between the savings pattern and income distribution appears to hold for smaller combinations of communities. The savings data are for native white unbroken families in twenty-five groups of nonfarm communities. A wider range of family types was covered in the North Central and Southern areas than in the other survey areas (see note 5). The income distributions used to associate with the savings data are, except for villages, estimates based on the survey data for all types of family. In the case of the villages, in the absence of more comprehensive information, it was necessary to use the survey income distributions for native white unbroken families, which leads to an overestimate of the relative number of families in the higher income brackets. In the Southern areas, the income distributions are for white families. None of the income distributions was adjusted for the greater refusal rate in the higher income groups. The data for all communities would doubtless have conformed more closely to the common pattern had it been possible to eliminate the effects of variations in the size of family and in the coverage of the data on income distribution.

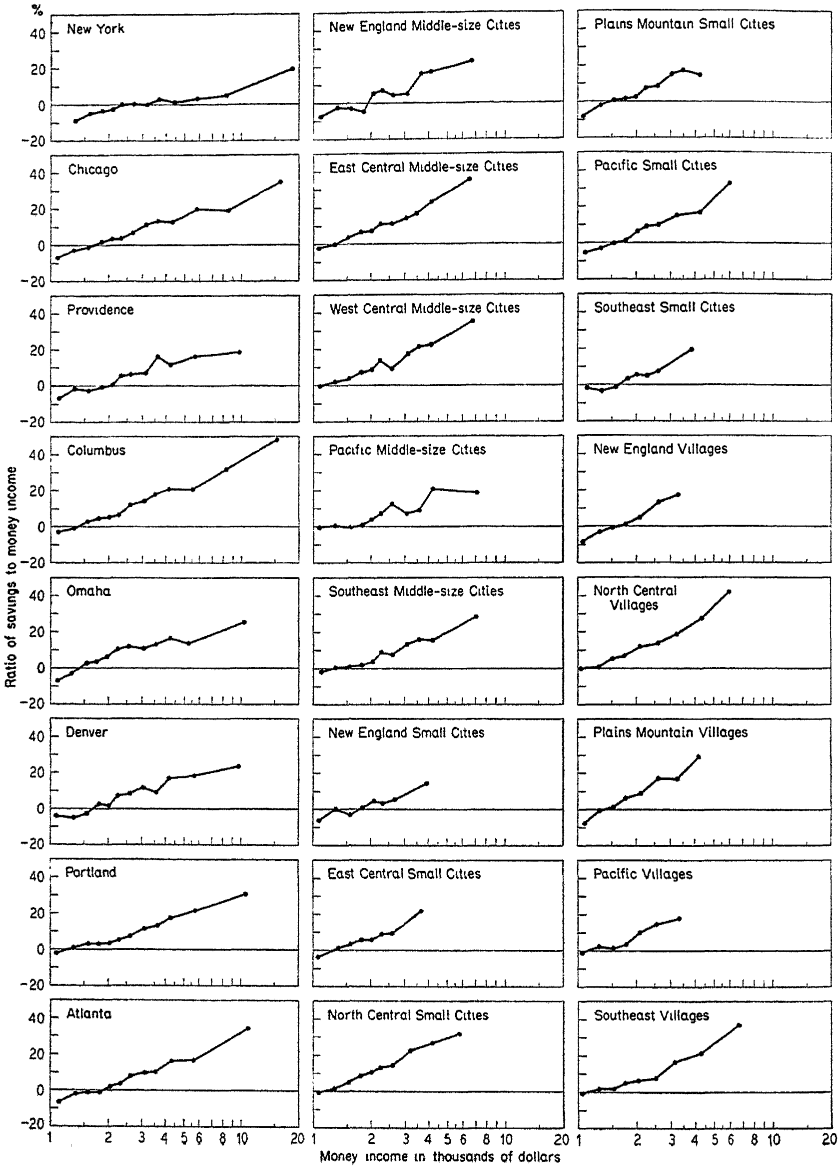
The two village groups emphasized in this chart present an interesting comparison. The median income was approximately the same in the Middle Atlantic and North Central villages as among white families in the southeastern villages. The percentage of families with incomes above $2,500 was, however, much higher in the southern, 12.4, than in the northern group of villages, 7.0. The percentage of income saved at each income bracket was consistently lower in the southern than in the northern villages. A similar comparison of two communities with the same median income is shown in Table 2. In Denver, where there were relatively more families in the higher income brackets, the percentage of money income saved tended to be lower than in Portland, Oregon.

The distinct position of the savings pattern for New York families cannot be explained in terms of the size of family or

CHART 2

# Savings of Nonfarm Families in Relation to Income and Income Distribution, 24 Groups of Communities 1935 – 1936

## A. Percentage of Income Saved in Relation to Annual Money Income

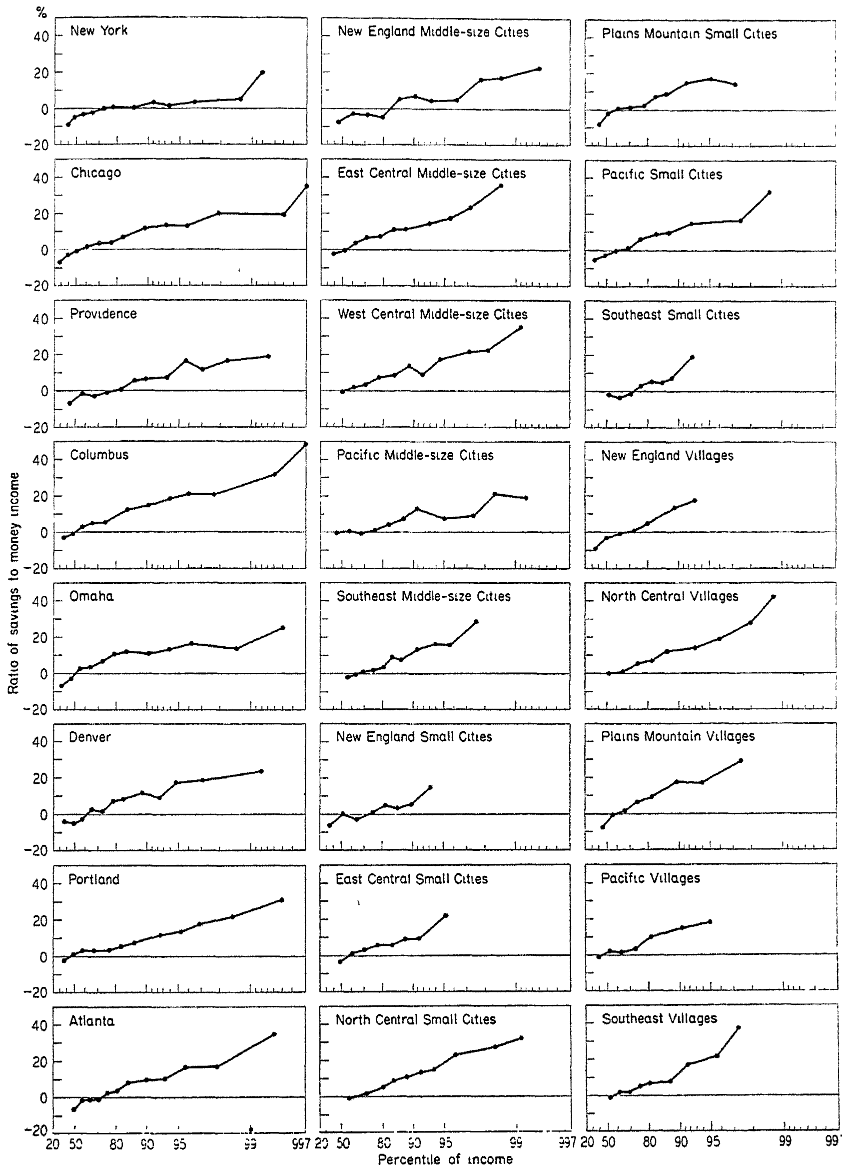



Horizontal scale, logarithmic

CHART 2 *(concl)*

# Savings of Nonfarm Families in Relation to Income and Income Distribution, 24 Groups of Communities 1935 – 1936

## B. Percentage of Income Saved in Relation to Percentile of Income




Horizontal scale, log(100–x)

TABLE 2

Savings and Income Distribution
Portland, Oregon, and Denver, Colorado, 1935–1936

| INCOME GROUP | INCOME DISTRIBUTION (cumulated) Portland | Denver | SAVINGS AS A % OF MONEY INCOME Portland | Denver |
|---|---|---|---|---|
| Under $1,000 | 100.0 | 100.0 | deficit | |
| 1,000– 1,250 | 62.9 | 62.9 | –2.1 | –4.1 |
| 1,250– 1,500 | 50.9 | 51.0 | 0.9 | –5.2 |
| 1,500– 1,750 | 41.6 | 42.2 | 3.2 | –3.0 |
| 1,750– 2,000 | 32.4 | 34.1 | 3.2 | 2.5 |
| 2,000– 2,250 | 23.9 | 27.3 | 3.3 | 1.5 |
| 2,250– 2,500 | 17.6 | 21.1 | 5.4 | 7.0 |
| 2,500– 3,000 | 13.2 | 17.0 | 7.4 | 8.3 |
| 3,000– 3,500 | 7.4 | 11.1 | 11.6 | 11.6 |
| 3,500– 4,000 | 4.7 | 7.6 | 13.3 | 9.1 |
| 4,000– 5,000 | 3.1 | 5.3 | 17.5 | 17.3 |
| 5,000– 7,500 | 1.5 | 2.9 | 21.7 | 18.3 |
| 7,500–10,000 | .5 | .8 | 30.6 | 23.7 |

Bureau of Labor Statistics, Washington 25, D. C.

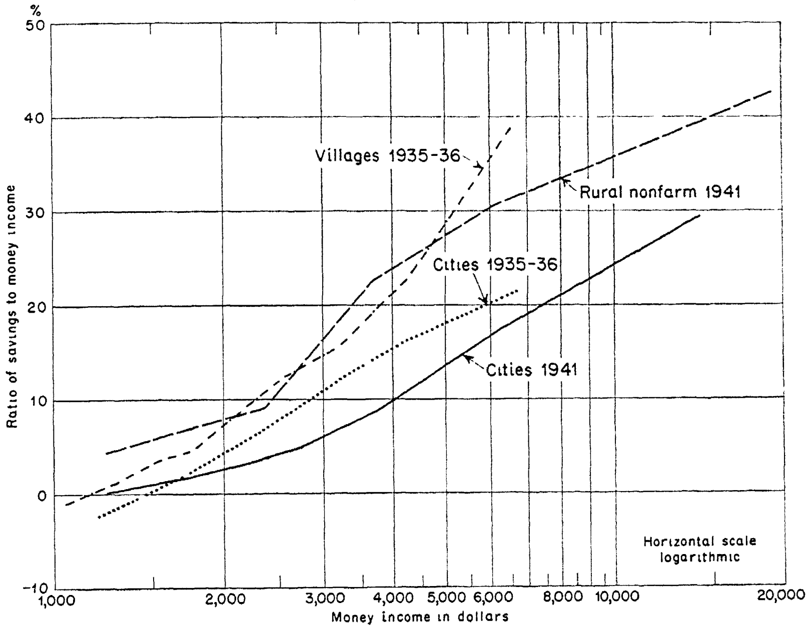
relatively greater error in the estimate of the income distribution. A comparison with data from other surveys in New York leads to the conclusion that this particular sample overstated the high consumption and low savings of New York families. In the Study of Money Disbursements of Wage Earners and Lower Salaried Clerical Workers made at about the same time, the savings in the income brackets above $3,000 were higher than in the sample for the Consumer Purchases Study. In the small sample of New York families included in the 1941 Study of Spending and Saving in Wartime, the savings were likewise higher at each income bracket than in the 1935–36 survey.

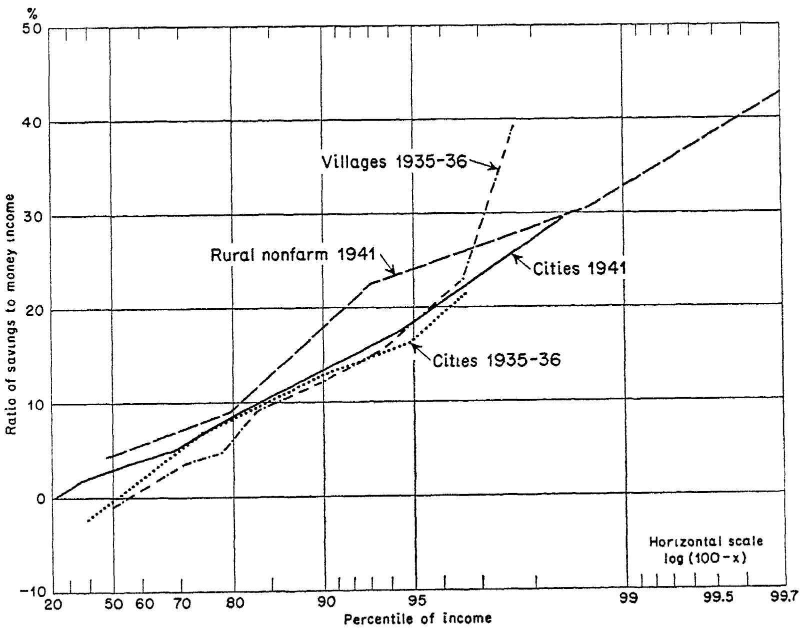
### 3 NONFARM FAMILIES, 1935–1936 AND 1941

Of particular interest is the apparent stability of the relation between savings as a percentage of income and the income distribution in the two periods, 1935–36 and 1941. As illustrated in Chart 3, the savings of urban families in 1941 were definitely lower than in 1935–36 in all income brackets above $1,500, and the savings of rural nonfarm families in both periods were higher than among urban families. When the percentages saved are associated with the percentiles (or fractions thereof) a large part of the difference is eliminated. The marked deviations may be ascribed, at least in part, to errors of estimate. The highest value in the 1935–36 village data, for example, was influenced by two very small samples in two regions. The variation at the lower end of the scale between the urban groups at the two

Chart 3

# Savings of Nonfarm Families in Relation to Income and Income Distribution 1935-36 and 1941



dates is due to changes in the average size of family. In the income brackets under $2,000 the average size of family was substantially smaller in 1941 than in 1935–36. At those income levels the smaller families at both dates reported some savings while the larger families reported smaller savings or deficits.

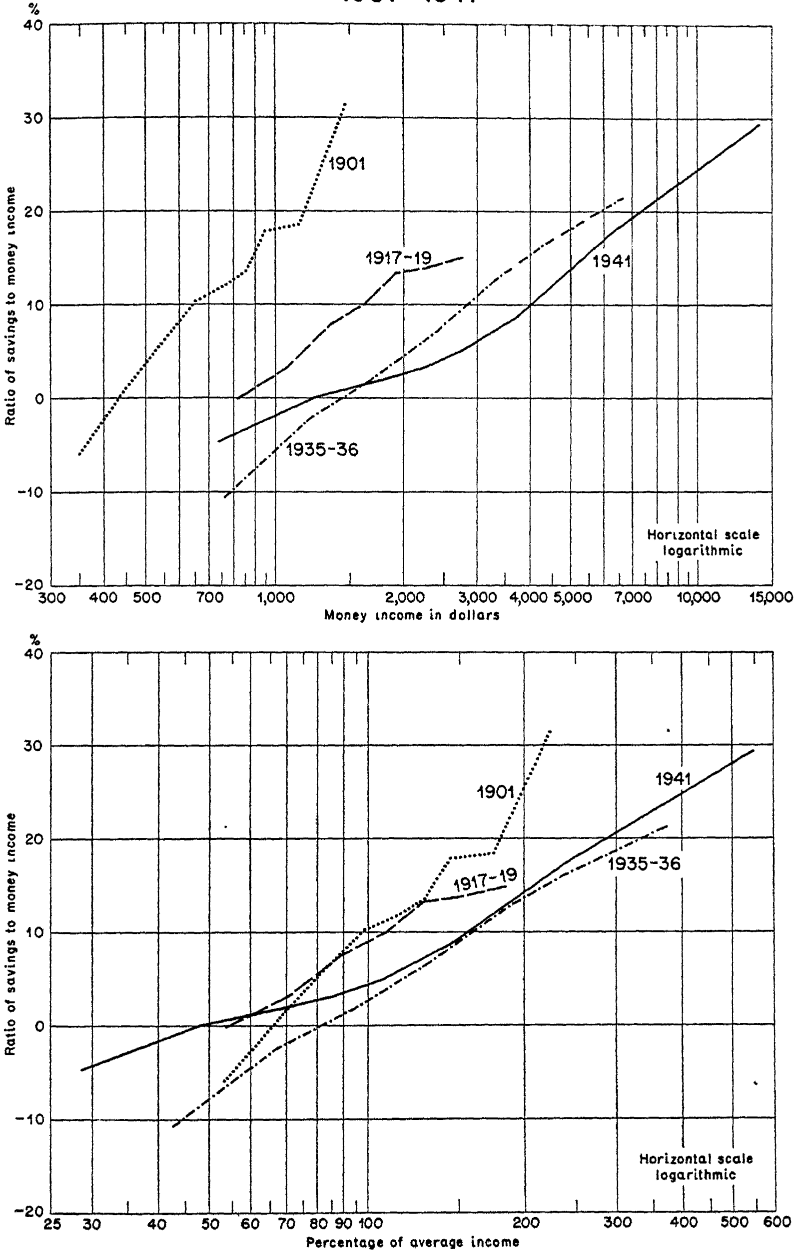
## 4 Urban Families, 1901–1941

The data from earlier studies are not adequate enough to check the stability of this relation over time in any complete sense. The position of the savings pattern has apparently shifted considerably since 1901 (Chart 4). At the same time, the average income (in current dollars) of urban families has increased substantially. No information exists on which to base an estimate of changes in the income distribution. Accordingly, the only way of comparing the savings patterns in terms of the income distribution is to eliminate the effect of the differences in average income. Neither of the earlier studies provided an estimate of the mean income of the urban or even of the urban wage earner population. If, however, the average income of the families surveyed is used as a first approximation, and the income for each income group is expressed as a ratio to this average, the savings patterns are brought much closer together. Inasmuch as the mean income assumed for the two earlier sample surveys is probably an underestimate, this conversion probably overemphasizes the convergence. Furthermore, since the average size of family was greater in the 1901 and 1917–19 surveys than in the two later studies, the differences in savings patterns for families of the same size must be assumed greater than is suggested by the chart. It is possible to explain the level of savings in 1917–19 in terms of Liberty Bond purchases. The high level of savings in 1901 must be accepted as representing a fundamental change in family consumption and savings.

For this comparison it was necessary to adjust the published figures for the two earlier surveys to approximate the savings concept used in the recent studies. Premiums on life insurance and principal payments on mortgages on owner-occupied houses were formerly included in the family expenditure side of the account. Accordingly, it was necessary to add the average outlays for these purposes to the figures reported as savings for comparison with the recent surveys.

CHART 4

## Savings of Urban Families in Relation to Income and Income Distribution 1901–1941



### 5 Farm Families, 1935–1936 and 1941

Savings among farm families are higher than among nonfarm families having the same current income or relative income position. The characteristic form of the savings pattern of the farm group is shown in Chart 5, which displays both data for all the area units of the 1935–36 study for which the samples included 600 families or more and data from the 1941 survey. The data on both income distribution and savings for the southern farm sections are for white operator families. Apparently, the distribution of income is a determinant of savings among farm as well as among nonfarm groups.

Inasmuch as the farm families are entirely in the entrepreneurial group, it is not unreasonable to assume that the year to year fluctuations in the income of the individual family are greater for farm than for nonfarm families. Expenditures and savings are without doubt dependent upon the expectation of a continuation of a given level of income. The high savings of farm families in the upper income brackets are probably due more to a behavior based upon experience with the wide fluctuations of agricultural returns than to any propensity to save in excess of the amounts characteristic of nonfarm families. In other words, were there data to show average savings in relation to average income for some period, say four or five years, the savings of farm families would not differ so much from the level characteristic of nonfarm families.

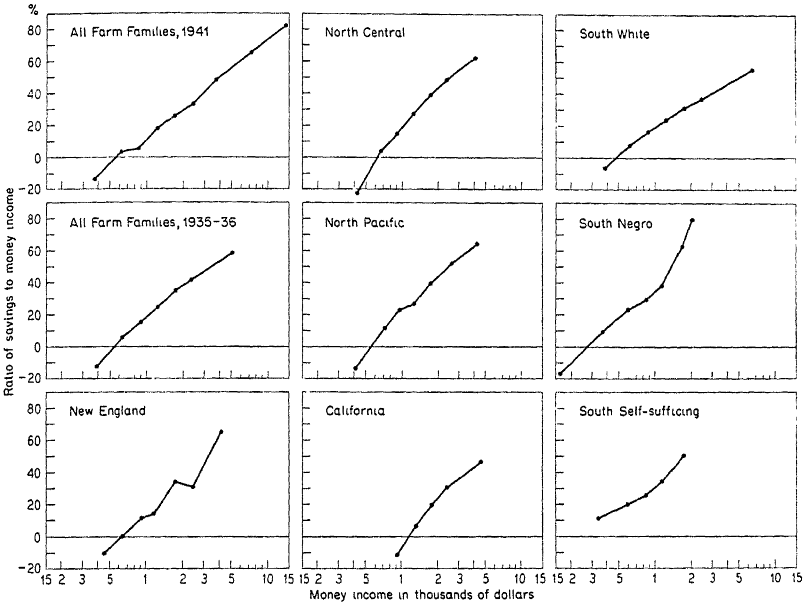
### 6 Negro Families, 1935–1936

At the same level of current income, Negro families save more than white (see note 5). The differences between the two groups in the level and distribution of income do not, however, account for the variation in the amount saved. In terms of relative position in the income distribution, white families save more than Negro (Chart 6). Although the samples are much too small to isolate any stability of savings patterns, a savings pattern characteristic of the Negro groups in relation to their relative incomes is suggested. The same percentile of income represents so much lower a dollar income among Negroes than among whites that a level of savings similar to that among white families of the same relative income would seem to involve almost

CHART 5

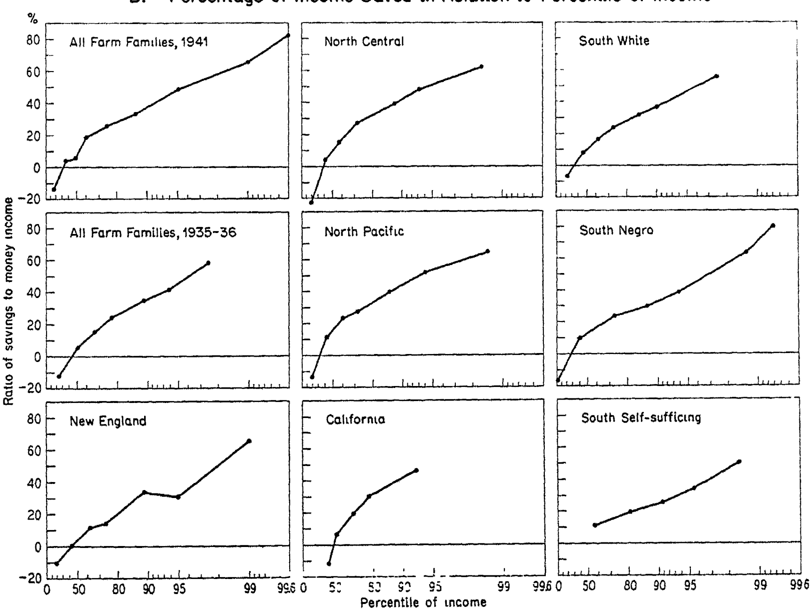
# Savings of Farm Families in Relation to Income and Income Distribution 1935 – 1936

## A. Percentage of Income Saved in Relation to Annual Money Income




Horizontal scale, logarithmic

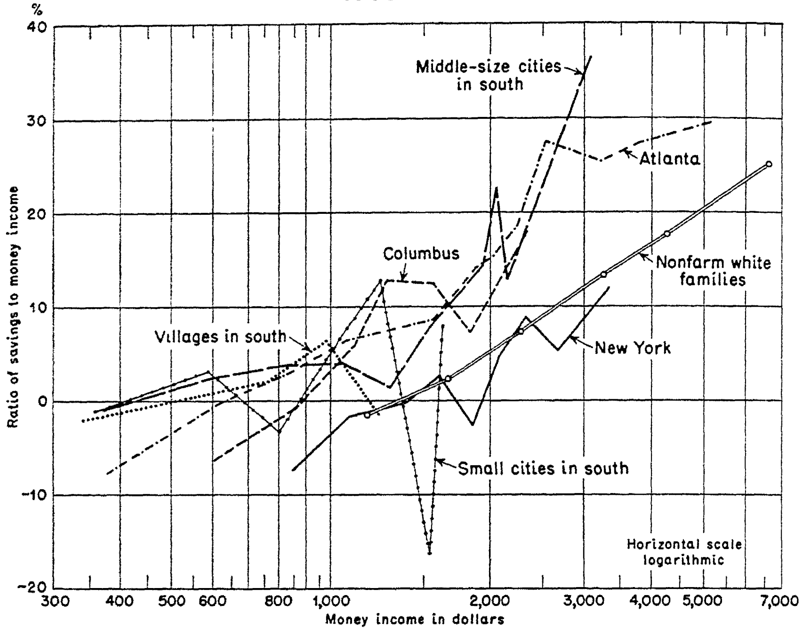
## B. Percentage of Income Saved in Relation to Percentile of Income

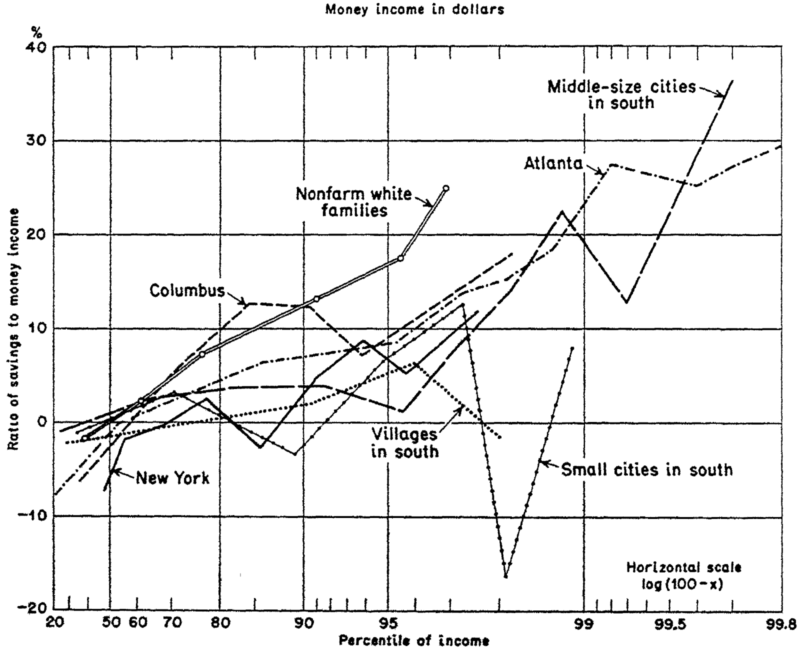



Horizontal scale, log(100−x)

CHART 6

## Savings of Negro Families in Relation to Income and Income Distribution 1935–1936



the impossible. There is, however, a further interpretation that deserves consideration. While the white families as a community may be independent of the expenditure patterns of the Negroes, the converse is probably not true. The Negroes' mode of living is doubtless influenced by consumption patterns of the white community as well as by their own social world. Evidence on this question and many others awaits a more extensive analysis of existing data and the accumulation of more data designed to elicit the forces that determine the expenditures and savings of families.

# RESOURCE DISTRIBUTION PATTERNS AND THE CLASSIFICATION OF FAMILIES

William Vickrey

In all the voluminous discussions and statistics on how the nation's resources are distributed among its citizens, far too little attention has been paid to the basis on which various groups of the population are classified. Consequently, much of the statistical material is poorly adapted to the purposes for which it has been produced and used, and many of the conclusions that have been drawn are without solid foundation, if not actually erroneous. The object of this paper is to investigate the effect of various methods of classification on the distribution of income and on the conclusions to be drawn concerning tax burdens, consumption patterns, and the propensity to consume.

## 1 The Reporting Unit and the Classification Basis

The basis of classification and the unit to be studied are separate questions. One may choose as a unit the family, the household, the individual, or the residents of a structure; the chief basis for the choice is ordinarily the ease with which the affairs of one unit can be disentangled from those of another. Provided the methods of classification are suitable, the results should not be greatly affected unless the unit is so large that the dispersion is substantially reduced by averaging within the unit. But too frequently some aggregate attribute of the unit, such as its income or wealth, becomes the basis for classification and no adjustment is made for the size of the unit or its characteristics; when this is done, the choice of a unit may incidentally involve a considerable difference in the method of classification and hence materially affect the final results.

However chosen, the unit should be classified according to some property relevant to the conclusions to be drawn. If such a property is not susceptible of direct measurement, it is necessary to select some readily available statistic that will correspond closely to the desired property. For example, if the fundamental purpose of a tabulation is to find out how many persons are at various levels of economic welfare, we can take income or expenditure levels as an indicator though we may not be able to measure welfare or even agree precisely on its meaning.

In practice, almost all the figures on the distribution of income and expenditure for the entire population are by classifications derived more by following the line of least resistance than by formulating a base pertinent to the purpose at hand. An aggregate of some quantity for the reporting unit is usually taken for the classification parameter with no adjustment for the relative size or importance of the unit. In *Statistics of Income*, returns are classified primarily by net income per return, a classification that corresponds neither to the economic welfare level of the taxpayer nor to the bracket in which his income will be taxed. In the studies of the National Resources Committee for 1935–36 the unit is logically enough the 'consumer unit' or the family household, but a consumer unit is classified according to its total income, regardless whether it consists of a family of seven or only of a single unattached individual.[1] Accordingly, the statement that the 'lowest third' of the consumer units receive 10 percent of total income does not mean much, for this lowest third includes single unattached persons with incomes of $750, but excludes large families with incomes of $800, who will in general be much worse off. To be sure, *Statistics of Income* classifies returns by family status, and some adjustment can be made to allow for differences between returns representing different numbers of individuals and entitled to different personal exemptions. But the adjustment is at best tedious and approximate, and would be more adequate if made by a proper classification in the first instance. The present classification is entirely unrelated to any of the many purposes to which the figures might be put: the most that can be said for it is that it

[1] *Consumer Incomes in the United States* (National Resources Committee, 1938); *Consumer Expenditures in the United States* (1939); *Family Expenditures in the United States* (1941).

preserves a certain degree of formal continuity from year to year. Again, the National Resources Committee studies have some tables with distributions by family size. But this is done for only a few data, and unless the user is prepared to undertake the monumental work of either treating each family size separately or recombining the figures in some way, he must accept data in which figures for a family of two with an income of $1,612 spending $429 for food are combined with families of seven or more having an income of $1,624 but spending $721 for food. By combining families at widely different welfare levels and having different spending patterns, merely because their aggregate income is the same, the differences in the spending patterns at different welfare levels are partly glossed over.

The possibilities of correcting for this combination of families of dissimilar habits and welfare levels in the same income groups are still fewer in the case of the 1941 consumer income and expenditure studies.[2] The size of the sample precluded tabulating different family sizes separately; and only family units and single consumers are segregated. Some improvement is possible through recombining single persons with families having, say, 2.5 times the income of single persons, but, as we shall see later, this procedure eliminates only a small part of the total bias arising from the method of classification.

Again, if an individual wishes to know where he stands in relation to the rest of the population, present tabulations give him no real answer. If A, who is a member of a family of two with an income of $2,000, consults the tables, he may find, for example, that 53 percent of the families have incomes of more than $2,000. But B, who is a member of a family of six with an income of $2,000, will come to the conclusion that he also is at the 53d percentile of the population, though he is obviously not nearly so well off as A. While this difference may be considered minor if the extra members of B's family are small children, the difference is striking if these other members are themselves wage earners.

## 2 Allowing for Size of Family

The desirability of some allowance for the size of the family has

[2] *Income and Spending and Saving of City Families in Wartime* (Bureau of Labor Statistics, Bul. 724, Sept. 1942); *Rural Family Spending and Saving in Wartime* (Department of Agriculture, Misc. Publication 520, June 1943).

long been recognized, but it has been difficult to decide upon a formula. Merely putting the figures on a per capita basis will not do, for individuals, particularly children, vary widely in their needs. A partial remedy has been sought by setting up for each member of the family a weighting factor reflecting his consumption needs relative to those of an adult gainfully employed male; by adding these weights for the various members of the family, a rating of the family's needs in terms of adult male maintenance units, 'ammains', can be obtained.

The difficulty, of course, is in agreeing upon a schedule of weights. Possibilities of deriving such weights from objective data are limited, and it seems almost inevitable that the coefficients should rest on some *a priori* notions of the relative needs of individuals of different ages, sexes, and occupations. To be sure, attempts have been made to compute the coefficients on the assumption that families spending a given fraction of their budget for the basic necessities such as food are on the same level of welfare. To be workable, this method requires that the proportion spent on the less essential categories increase uniformly as the level of welfare rises. On this assumption, one could plot this percentage against total outlay separately for each family composition, and a comparison of the total outlay at which a given percentage goes to necessities for the various types of family would yield a clue to relative needs. The difficulty is that it is impossible to draw a sharp line between necessities and luxuries, and the results will depend upon where the line is drawn. For example, if the proportion of outlay for food alone were taken as the index of welfare, the results would differ from those which would be obtained if rent were included among 'necessities', for it seems logical to assume that a large family will naturally spend a bigger proportion of its budget for food and less for rent than a small family, even at the same level of welfare. Again, the relative shares of the family members in the family resources may vary considerably from one welfare level to another, so that a coefficient appropriate at one level might not be appropriate at another; thus a single set of coefficients would probably be inadequate to give the complete picture.

Attempts have also been made to compute coefficients by setting up budgets designed to provide a given standard of

health. This approach is most applicable to food: the cost of achieving certain dietary standards can be ascertained and used as a basis. However, this method is applicable only to a small part of the total budget, and in any case must be qualified by the observation that in practice families do not feed themselves scientifically but in accordance with many prejudices and customs. These can be taken into account in setting up the hypothetical budgets, but the results are likely to be correspondingly less precise.

Some expenditures are fairly clearly for the benefit of individual members of the family. One example is clothing, and it may be possible to set up schedules of relative clothing needs by actually observing the amount spent on the clothing worn by the various members of the family. But even here, where there is a substantial amount of handing down and remodeling, this method may have to rely to a considerable extent on arbitrary allocations of the cost of clothing worn by more than one person.

For a large part of family expenditure, however, there is no ready method of apportionment among the family members, especially of rent and household operation items. It appears therefore, that the weights assigned the various members must remain in considerable measure a matter of subjective appraisal.[3] But the fact that subjective appraisal is involved in making an allowance for family size is no excuse for making no allowance at all under the pretext of preserving a spurious objectivity. Any allowance, no matter how arbitrary, is preferable to a patent absurdity, if the allowance is even remotely reasonable.

One notable attempt to classify families by economic welfare level was the 1934–36 'Study of Money Disbursements of Wage Earners and Clerical Workers'.[4] The families were classified according to 'annual unit expenditure'. Separate family size factors were set up for food, for clothing, and for all other expenditures. Scales of relative consumption needs for the first two items were based on standard budgets, but for other ex-

[3] For a discussion of consumption scales as a measure of size of family see Robert Morse Woodbury, 'Economic Consumption Scales and their Uses', 39 *Journal of the American Statistical Association*, 455 (Dec. 1944).

[4] Bureau of Labor Statistics, Bul. 638, pp. 362–6, 56–65, and various tables.

penditures all persons were treated as equal units. The final number of consumption units in the family was an harmonic mean of the three measures, weighted by the actual expenditure of the family for the three types of consumption.

Unfortunately no such procedure has ever been applied to a complete sample. Failure to apply this procedure or an improvement of it to subsequent studies is probably in part due to the fact that it was fairly complex: it was somewhat difficult for persons accustomed to thinking in terms of family income classifications to grasp the significance of the figures. These fundamentally more meaningful figures might have been more widely accepted had the classification been simpler, and had greater prominence been given to the average family incomes and average family sizes of the families classified in a given unit expenditure group.

Nor does the complexity of the method used for determining family size seem to be justified by any superiority of the results: the procedure adopted implies that two families of identical composition may differ in the number of consumption units merely because they divide their consumption differently among food, clothing, and other items; e.g., if one family does its own baking using purchased fuel instead of buying bakery products, it would in general be considered to contain more consumption units. Since the family size obtained by this method depends upon the distribution of expenditure within the family, it cannot be ascertained merely from figures on the composition of the family by age, sex, and occupation. It is thus difficult for the average person to appraise the number of consumer units represented by his own family, and also to compare the figures so gathered with figures obtained from data that do not admit of such a complicated method of appraising family size.

The assumption that all family members shared equally in expenditures other than for food and clothing is particularly open to question, but can well be accepted on the grounds of simplicity and in the absence of any objective alternative. Even here, however, a set of factors, no matter how uncertain, would have been preferable. It does not seem likely, for instance, that outlays other than for food and clothing for a family consisting of husband, wife, and four children would be double those of a

family consisting of husband, wife, and one child, at the same welfare level. While considerable subjective judgment might be involved in setting up factors for such expenditures, such factors would be preferable to an arbitrary assumption that all persons of whatever age count equally.

In any case, it is almost impossible to correct the more comprehensive figures by this partial sample, for it specifically excludes the unemployed, the self-employed, and families having substantial property incomes. As the fluctuations of income experienced by these other groups differ greatly from those experienced by the rather drastically restricted sample, the extension of the results obtained in this sample to the entire population would be entirely unwarranted.

### 3 Income vs. Expenditure as a Basis for Classification

Except in the 1934–36 wage earner study, the parameter used for classifying the economic units has almost invariably been a variant of income. This is natural enough in statistics derived from an income tax, and even in presenting the distribution of income. But it is at least curious that in all the more inclusive studies of consumer expenditures the classification by income is retained and that in studies purporting to measure the welfare of various economic groups, income is used almost exclusively as a basis for classification.

Classification by income would probably be innocuous enough if only the data permitted classification by income for a fairly long period so that fluctuations could be averaged. But nearly all statistics are for the income of a single year. In fact, it is extremely difficult to get figures covering a longer period. Families move, change in size, break up, form, and so on — all of which require continual adjustments. It is by no means certain how figures covering the income of individual families for a series of years should be processed even if the raw materials could be obtained.[5]

Incomes fluctuate in varying degree from year to year, not only together with national income but also as a result of de-

[5] The Wisconsin Tax Commission has published *Changes in Income of Identical Taxpayers, 1929–1935* (1939); see also *Analysis of Wisconsin Income*, by Frank Hanna, Joseph Pechman, and Sidney Lerner, a study prepared for the Conference on Research in Income and Wealth.

velopments affecting the individual, such as sickness, unemployment, overtime work, business ventures, gains or losses on the stock exchange, the writing of a best seller, high temporary earning as an actress or athlete, retirement, good or bad crops. Thus the income for any given year may not at all reflect the long run prospects of an individual. If we are interested in actual standards of living, annual expenditure comes much closer to giving us what we want. Even if fundamentally we are interested in the long run average level of income, annual expenditure may be a better indicator of relative rank, for purposes of classification than annual income, for it at least reflects past savings and in some degree also the individual's expectations regarding his future income, as well as his actual current income.

The effect of using income for a single year rather than average income for a period as a basis for classification tends not only to blur differences in expenditure patterns through aggregating items for units at considerably different levels of economic welfare, but also to exaggerate the inequality of the distribution of income.

In effect, there are three sources of variance in annual incomes: general changes in national income, fluctuations in the income of individuals, and differences in the long run average economic status of individuals. A classification by income for a single year eliminates the first, but retains the last two. It will show a greater dispersion of individuals than would an average income for several years. In the top income groups will be a relatively large number of persons whose income is higher than normal, and who must make some provision from this unusual income for the future when their income may be lower. In the bottom income groups will be a relatively large number of persons whose income is only temporarily low, and who will be able to maintain a fairly high standard of living by drawing on their savings.

The distortions produced by using annual income as a basis for classification are moderately important when the distribution of income is considered, and extremely serious when savings and expenditure patterns are considered and an attempt is made to derive a propensity to consume function. The savings of the lower income groups are greatly understated and their consumption overstated by including persons who maintain

a fairly high level of consumption by drawing on savings; conversely, the savings of those at the top of the scale are exaggerated and their consumption understated. Consequently, the usual figures on the concentration of savings greatly overstate the savings of persons at the upper economic levels, and marginal propensity to consume figures are generally too low.

## 4 The Experimental Tabulation

In an attempt to give some notion of the magnitude of some of the biases arising from the usual methods of tabulation, 2,147 schedules from the recent Study of Family Spending and Saving in Wartime were retabulated: 925 representing rural nonfarm units surveyed by the Bureau of Human Nutrition and Home Economics and 1,222 representing urban families surveyed by the Bureau of Labor Statistics.[6] The BLS sample was designed to cover 1 in 20,000 urban families, that of the BHNHE 1 in 10,000 rural nonfarm families; accordingly, in combining the sample figures, the BLS sample was multiplied by 2, so that the combined results represent approximately 1 in 10,000 nonfarm families in the nation. Although in preparing a general distribution of income from the sample, the BLS and the BHNHE varied the weights for the several income groups somewhat, no adjustment for these variations in weightings were made in the present figures. The validity of such variations in the weights for classifications by per capita income and expenditure is at best doubtful and would tend to cancel in the reshuffling. Moreover, the present figures are but approximations at best, since no schedules for farm families were included. Even as adjusted, there is a general feeling that single persons are greatly under-represented in the original sample. The present figures are intended to indicate differences brought about by reclassification; they are not a complete income distribution in themselves.

In setting up a figure representing family size, the following scheme was used. Persons over 20 years of age were counted as an 'equivalent adult' if they worked more than 34 weeks during the year; as 0.9 of an equivalent adult if they worked 12 to 34 weeks, and 0.8 if they worked less than 12 weeks. Persons

[6] These schedules were made available to the Committee for Economic Development, under whose auspices the retabulation was carried out.

between 16 and 20 were counted as 1 if they worked more than 34 weeks, 0.8 if they worked 12 to 34 weeks, and 0.7 if they worked less than 12 weeks. Children aged 11 to 15 were counted as 0.5; children aged 6 to 10, as 0.4; and children under 6 years old, as 0.3. In addition, for the first child under 15, 0.2 was added to the total as an allowance for the initial expenses involved in setting up a household with accommodations for a child, expenses that in general are not duplicated for additional children. Thus a family consisting of a husband working full time, a wife not gainfully employed, and two children aged 3 and 6 would be assigned a 'size' of 2.7 (1.0 + 0.8 + 0.3 + 0.4 + 0.2); a family consisting of a husband and wife, both working full time, and a daughter aged 18 not working would be assigned a 'size' of 2.7 (1.0 + 1.0 + 0.7). Though admittedly arbitrary, this scheme is not unreasonable and will probably produce results not greatly different from any system that might be devised from more precise data. Moreover, it is simple enough to be readily applied by an individual to his own status and to be readily understood.

The number of 'equivalent adults' in each family was computed according to the above scheme, and the income and expenditure divided by this figure, to obtain the income and expenditure per equivalent adult. Tables 1 and 2 show the number of schedules, number of equivalent adults, total income, and total expenditure, by income and expenditure per equivalent adult. Tables 3 and 4 show these figures tabulated by family income and by family size.

In some cases a separation of the data into single and family schedules is available when a more detailed distribution by size of family is not. A partial correction may be attempted by adjusting the single data and combining them with the family data in such a way that single persons are combined with the family income group having the same average income per equivalent adult. As a means of ascertaining what the proper relation between single and family groups should be, the average size of families and of single individuals is compared in Table 5.

# Table 1

## Sample Number of Schedules and Number of Equivalent Adults, 1941, by Income and Expenditure per Equivalent Adult

| Expenditure per Equivalent Adult Groups | Under $0 | 0 to 200 | 200 to 300 | 300 to 400 | 400 to 500 | 500 to 600 | 600 to 700 | 700 to 800 | 800 to 900 | 900 to 1,000 | 1,000 to 1,200 | 1,200 to 1,500 | 1,500 to 2,000 | 2,000 to 3,000 | 3,000 to 5,000 | Over 5,000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | INCOME PER EQUIVALENT ADULT GROUPS | | | | | | | | | | | | | | | | |
| | NUMBER OF SCHEDULES | | | | | | | | | | | | | | | | |
| $0– 200 | | * 245 | 32 | | | | | | | | | | | | | | 279 |
| 200– 300 | | 35 | * 168 | 54 | 9 | 1 | 3 | | | 1 | | | | | | | 271 |
| 300– 400 | | 9 | 42 | * 162 | 49 | 7 | 5 | | | | | | | | | | 274 |
| 400– 500 | | 7 | 7 | 43 | * 152 | 84 | 19 | 6 | 3 | 2 | | | | | | | 323 |
| 500– 600 | | | 1 | 16 | 44 | * 140 | 78 | 25 | 6 | 4 | 2 | 2 | | | | | 318 |
| 600– 700 | | 4 | 2 | 10 | 6 | 66 | * 107 | 96 | 19 | 12 | 17 | 5 | | | | | 344 |
| 700– 800 | | | 1 | 4 | 5 | 13 | 54 | * 91 | 66 | 36 | 23 | 7 | | | | | 300 |
| 800– 900 | | | | | 2 | 7 | 18 | 36 | * 99 | 50 | 33 | 9 | 2 | | | | 256 |
| 900–1,000 | | 2 | | | 2 | 4 | 5 | 18 | 26 | * 64 | 62 | 24 | 5 | | | | 212 |
| 1,000–1,200 | 2 | 2 | 1 | 3 | 2 | 3 | | 11 | 13 | 24 | * 134 | 88 | 19 | | 2 | | 304 |
| 1,200–1,500 | | 2 | | | 2 | | 1 | 2 | 2 | 7 | 40 | * 83 | 59 | 14 | 5 | | 217 |
| 1,500–2,000 | | | | 1 | | | | | 2 | | 3 | 46 | * 69 | 47 | 9 | | 177 |
| 2,000–3,000 | | | | | | 2 | | | 2 | | 2 | 2 | 8 | * 42 | 5 | 2 | 65 |
| 3,000–5,000 | | | | | 2 | | | | | | | | | 2 | * 16 | 4 | 24 |
| Over 5,000 | | | | | | | | | | | | | | | | * 5 | 5 |
| Total | 2 | 306 | 254 | 293 | 275 | 327 | 290 | 287 | 238 | 200 | 316 | 266 | 162 | 105 | 37 | 11 | 3,369 |
| | NUMBER OF EQUIVALENT ADULTS | | | | | | | | | | | | | | | | |
| $0– 200 | | * 669.5 | 74.6 | | | | | 1.6 | | | | | | | | | 745.7 |
| 200– 300 | | 84.0 | * 447.3 | 133.8 | 14.0 | 2.0 | 4.3 | | | .9 | | | | | | | 686.3 |
| 300– 400 | | 18.1 | 112.5 | * 459.2 | 150.4 | 17.8 | 11.0 | | | | | | | | | | 769.0 |
| 400– 500 | | 15.0 | 14.7 | 116.0 | * 411.9 | 212.2 | 42.8 | 14.7 | 8.8 | 1.6 | | | | | | | 837.7 |
| 500– 600 | | | 2.4 | 42.0 | 150.1 | * 377.1 | 207.8 | 63.2 | 16 8 | 8.6 | 2.0 | 5.8 | | | | | 875.8 |
| 600– 700 | | 7.2 | 1 8 | 18.5 | 10.2 | 193.1 | * 265.3 | 255.3 | 51.0 | 37.4 | 45.8 | 9.5 | | | | | 894.9 |
| 700– 800 | | | 1.0 | 20.4 | 11.5 | 28.1 | 122.4 | * 250.2 | 171.6 | 90.9 | 60.1 | 15.6 | | | | | 771.8 |
| 800– 900 | | | | | 11.6 | 13.8 | 46.4 | 92.4 | * 249.4 | 120.6 | 87.7 | 21.6 | 7.0 | | | | 650.5 |
| 900–1,000 | | 1.6 | | | 3.4 | 61.9 | 11.9 | 46.1 | 62.7 | * 160.4 | 143.3 | 50.8 | 10.3 | | | | 497.4 |
| 1,000–1,200 | 3.6 | 3.2 | 1.6 | 2.6 | 4.5 | 9.2 | | 29 6 | 34.0 | 54.5 | * 305 2 | 177 7 | 37.6 | | 3.6 | | 666.9 |
| 1,200–1,500 | | 1.6 | | | 4.8 | | .8 | 6.6 | 5.0 | 14.5 | 73.6 | * 205 3 | 118 4 | 22 1 | 10.8 | | 463.5 |
| 1,500–2,000 | | | | 1.6 | | | | | 1.6 | | 8.0 | 87 2 | * 154.6 | 100.3 | 19.0 | | 372.3 |
| 2,000–3,000 | | | | | | 1.6 | | | 6.8 | | 3.6 | 1.6 | 13.6 | * 83.5 | 7.4 | 5 6 | 123.7 |
| 3,000–5,000 | | | | | 1.6 | | | | | | | | | 1.6 | * 38 8 | 9 2 | 51.2 |
| Over 5,000 | | | | | | | | | | | | | | | | * 7.4 | 7.4 |
| Total | 3.6 | 800.2 | 655.9 | 794.1 | 774.0 | 861.8 | 712.7 | 759.5 | 607.7 | 489.4 | 729.3 | 575.1 | 341.5 | 207.5 | 79.6 | 22.2 | 8,414.1 |

* For the division of the principal diagonal between schedules with savings and those with dissavings see my Reply below.

TABLE 2

# Total Income and Total Expenditures, 1941, by Income and Expenditure per Equivalent Adult

| Expenditure per Equivalent Adult Groups | Income per Equivalent Adult Groups: Under $0 | 0 to 200 | 200 to 300 | 300 to 400 | 400 to 500 | 500 to 600 | 600 to 700 | 700 to 800 | 800 to 900 | 900 to 1,000 | 1,000 to 1,200 | 1,200 to 1,500 | 1,500 to 2,000 | 2,000 to 3,000 | 3,000 to 5,000 | Over 5,000 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | TOTAL INCOME (dollars) | | | | | | | | | |
| $0– 200 | | 90,019 | 17,068 | | | | | 1,174 | | | | | | | | | 108,261 |
| 200– 300 | | 13,967 | 113,074 | 44,682 | 6,220 | 1,032 | 2,860 | | | 860 | | | | | | | 182,695 |
| 300– 400 | | 2,716 | 29,276 | 162,770 | 66,161 | 9,790 | 7,164 | | | | | | | | | | 277,877 |
| 400– 500 | | 2,239 | 3,810 | 42,912 | 188,255 | 113,767 | 27,245 | 10,776 | 7,581 | 1,554 | | | | | | | 398,139 |
| 500– 600 | | | 618 | 15,059 | 70,660 | 208,819 | 132,899 | 46,202 | 13,727 | 7,784 | 2,263 | 7,344 | | | | | 505,375 |
| 600– 700 | | 369 | 414 | 6,653 | 4,562 | 108,843 | 170,945 | 190,311 | 42,376 | 35,506 | 49,030 | 12,798 | | | | | 621,807 |
| 700– 800 | | | 238 | 7,446 | 5,441 | 15,797 | 80,598 | 186,677 | 145,074 | 84,950 | 65,375 | 19,967 | | | | | 611,563 |
| 800– 900 | | | | | 5,404 | 7,950 | 30,308 | 69,836 | 212,298 | 114,210 | 95,999 | 29,152 | 10,666 | | | | 575,823 |
| 900–1,000 | | 20 | | | 1,574 | 3,596 | 7,573 | 34,177 | 54,353 | 150,658 | 156,255 | 65,050 | 17,114 | | | | 490,370 |
| 1,000–1,200 | −250 | 582 | 409 | 957 | 1,950 | 5,164 | | 22,486 | 28,679 | 51,385 | 333,958 | 228,009 | 59,652 | | 11,872 | | 744,853 |
| 1,200–1,500 | | 42 | | 542 | 2,000 | | 523 | 4,792 | 4,000 | 13,376 | 83,090 | 276,853 | 191,102 | 48,453 | 34,906 | | 659,679 |
| 1,500–2,000 | | | | | | | | | 1,370 | | 8,926 | 121,881 | 258,009 | 245,170 | 76,753 | | 712,009 |
| 2,000–3,000 | | | | | | 840 | | | 5,700 | | 4,000 | 2,068 | 26,084 | 208,603 | 28,462 | 40,286 | 316,043 |
| 3,000–5,000 | | | | | 712 | | | | | | | | | 3,390 | 137,892 | 65,580 | 207,574 |
| Over 5,000 | | | | | | | | | | | | | | | | 111,455 | 111,455 |
| Total | −250 | 109,954 | 164,907 | 281,021 | 352,939 | 475,598 | 460,115 | 566,431 | 515,158 | 460,283 | 798,896 | 763,122 | 562,527 | 505,616 | 289,885 | 217,321 | 6,523,523 |
| | | | | | | | | TOTAL EXPENDITURES (dollars) | | | | | | | | | |
| $1– 199 | | 90,489 | 13,039 | | | | | 1,892 | | | | | | | | | 105,420 |
| 200– 300 | | 19,238 | 111,319 | 36,875 | 4,058 | 579 | 1,168 | | | 262 | | | | | | | 173,494 |
| 300– 400 | | 5,991 | 36,208 | 158,545 | 56,113 | 6,160 | 3,857 | | | | | | | | | | 266,874 |
| 400– 500 | | 6,592 | 6,239 | 49,569 | 184,733 | 98,802 | 19,399 | 6,711 | 3,970 | 752 | | | | | | | 376,767 |
| 500– 600 | | | 1,330 | 23,203 | 79,936 | 206,208 | 116,880 | 35,716 | 9,494 | 4,990 | 1,114 | 3,224 | | | | | 482,095 |
| 600– 700 | | 4,838 | 1,256 | 12,106 | 6,680 | 123,880 | 170,583 | 165,669 | 33,884 | 24,312 | 29,624 | 6,309 | | | | | 579,141 |
| 700– 800 | | | 716 | 15,674 | 8,800 | 21,212 | 90,458 | 185,018 | 129,398 | 69,168 | 45,044 | 12,030 | | | | | 577,578 |
| 800– 900 | | | | | 10,230 | 11,360 | 38,783 | 78,028 | 210,040 | 102,354 | 75,523 | 18,389 | 5,890 | | | | 550,597 |
| 900–1,000 | | 1,548 | | | 3,062 | 6,657 | 11,151 | 43,609 | 58,988 | 150,421 | 136,071 | 49,168 | 9,691 | | | | 470,366 |
| 1,000–1,200 | 3,728 | 3,568 | 1,612 | 2,815 | 4,638 | 9,911 | | 31,748 | 37,403 | 58,984 | 333,396 | 194,325 | 41,410 | | 3,754 | | 727,292 |
| 1,200–1,500 | | 2,232 | | | 6,164 | | 1,095 | 8,118 | 6,152 | 18,602 | 93,450 | 271,624 | 159,223 | 28,186 | 15,461 | | 610,307 |
| 1,500–2,000 | | | | 2,584 | | | | | 2,406 | | 13,361 | 142,440 | 259,323 | 185,700 | 34,118 | | 639,932 |
| 2,000–3,000 | | | | | | 4,408 | | | 17,822 | | 8,000 | 3,436 | 29,256 | 189,267 | 18,697 | 15,760 | 286,646 |
| 3,000–5,000 | | | | | 4,818 | | | | | | | | | 5,408 | 131,065 | 40,796 | 184,087 |
| Over 5,000 | | | | | | | | | | | | | | | | 77,033 | 77,033 |
| Total | +3,728 | 134,491 | 171,719 | 301,371 | 369,232 | −489,177 | 453,374 | 556,509 | 509,557 | 429,845 | 735,583 | 700,945 | 504,793 | 408,561 | 205,095 | 133,589 | 6,107,569 |

For the division of the principal diagonal between schedules with savings and those with dissavings see my Reply below.

## Table 3

### Sample Number of Schedules and Number of Equivalent Adults, 1941, by Family Income and Size

| Income per family groups | 0–.8 | .9–1.0 | 1.1–2.0 | 2.1–2.5 | 2.6–3.0 | 3.1–3.5 | 3.6–4 0 | 4.1–5.0 | 5 1–6.0 | Over 6.0 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Family size (equivalent adults) groups | | | | | | | | | | |
| | Number of schedules | | | | | | | | | | |
| $0– 500 | 98 | 83 | 151 | 38 | 24 | 15 | 9 | 5 | 1 | | 424 |
| 500– 750 | 31 | 69 | 86 | 32 | 25 | 24 | 14 | 24 | 5 | 2 | 312 |
| 750– 1,000 | 11 | 48 | 94 | 34 | 49 | 19 | 9 | 16 | 2 | 3 | 285 |
| 1,000– 1,250 | 10 | 50 | 101 | 54 | 25 | 29 | 13 | 8 | 4 | | 294 |
| 1,250– 1,500 | | 28 | 83 | 49 | 54 | 27 | 23 | 8 | | 2 | 274 |
| 1,500– 2,000 | 5 | 30 | 125 | 97 | 114 | 50 | 36 | 39 | 5 | 7 | 508 |
| 2,000– 2,500 | 6 | 16 | 134 | 74 | 91 | 69 | 20 | 25 | 10 | 2 | 447 |
| 2,500– 3,000 | 3 | 11 | 51 | 54 | 81 | 54 | 17 | 35 | 11 | 6 | 323 |
| 3,000– 4,000 | 1 | 2 | 58 | 29 | 58 | 33 | 28 | 34 | 11 | 7 | 261 |
| 4,000– 5,000 | | 2 | 23 | 9 | 26 | 15 | 12 | 12 | 9 | 4 | 112 |
| 5,000– 7,000 | | | 13 | 9 | 8 | 13 | 7 | 8 | 8 | 9 | 75 |
| 7,000–10,000 | | | 2 | 4 | 2 | 4 | 2 | | 2 | 2 | 18 |
| 10,000–15,000 | 2 | | | 1 | 2 | 2 | 10 | 4 | | 4 | 25 |
| Over 15,000 | | | 5 | | 4 | | | 2 | | | 11 |
| Total | 167 | 339 | 926 | 484 | 563 | 354 | 200 | 220 | 68 | 48 | 3,369 |
| | Number of equivalent adults | | | | | | | | | | |
| $0– 500 | 78.4 | 80.9 | 256.9 | 89.8 | 66.3 | 48.7 | 34.4 | 22 6 | 5.1 | | 683.1 |
| 500– 750 | 24.8 | 66 8 | 146.7 | 75 6 | 70.2 | 78 4 | 53 1 | 108 2 | 27 6 | 13 3 | 664.7 |
| 750– 1,000 | 8.8 | 46.9 | 164.5 | 81.1 | 133.8 | 61 5 | 33.9 | 72 2 | 10.4 | 19 5 | 632.6 |
| 1,000– 1,250 | 8.0 | 49.2 | 178.4 | 126.7 | 70.3 | 97.0 | 49.2 | 35 2 | 20 4 | | 634.4 |
| 1,250– 1,500 | | 27.6 | 149.4 | 115.7 | 148.3 | 89.8 | 86.8 | 36 2 | | 12 8 | 666.6 |
| 1,500– 2,000 | 4.0 | 30.0 | 225.3 | 230.4 | 310.8 | 165.1 | 137.4 | 170.0 | 26 5 | 45.6 | 1,345.1 |
| 2,000– 2,500 | 4.8 | 16.0 | 246.2 | 177.4 | 250.6 | 255.6 | 75.7 | 110 5 | 54 0 | 13.4 | 1,174.2 |
| 2,500– 3,000 | 2.4 | 11.0 | 94.7 | 129.4 | 225.3 | 178.7 | 64.4 | 155 2 | 62.8 | 42 2 | 966.1 |
| 3,000– 4,000 | .8 | 2.0 | 109.4 | 69.5 | 160.6 | 109.9 | 105.9 | 146.6 | 60.1 | 45.1 | 809 9 |
| 4,000– 5,000 | | 2.0 | 43.3 | 21.5 | 72 9 | 49 6 | 44.5 | 53.4 | 49 2 | 29.2 | 365.6 |
| 5,000– 7,000 | | | 23.8 | 22.1 | 22.2 | 43.9 | 26.3 | 37.2 | 44 0 | 60.5 | 280.0 |
| 7,000–10,000 | | | 3.8 | 9.6 | 5 2 | 14.0 | 7.4 | | 12.0 | 12.2 | 64.2 |
| 10,000–15,000 | 1.6 | | | 2.5 | 5.2 | 6.8 | 36.8 | 18.8 | | 27 0 | 98 7 |
| Over 15,000 | | | 9.4 | | 11.2 | | | 8 2 | | | 28.8 |
| Total | 133.6 | 332 4 | 1,651.8 | 1,151.3 | 1,552.9 | 1,169.0 | 755 8 | 974 3 | 372 1 | 320.8 | 8,414 0 |

## Table 4

## Sample Total Income and Total Expenditures, 1941, by Family Income and Size

| Income per family groups | Family size (equivalent adults) groups: 0–.8 | .9–1.0 | 1 1–2.0 | 2 1–2.5 | 2.6–3.0 | 3.1–3 5 | 3.6–4 0 | 4.1–5.0 | 5.1–6.0 | Over 6 0 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total income (dollars)** | | | | | | | | | | |
| $0– 500 | 25,990 | 22,881 | 46,610 | 13,230 | 7,209 | 4,600 | 3,622 | 1,721 | 482 | | 126,345 |
| 500+ 750 | 19,007 | 42,551 | 50,362 | 19,237 | 15,706 | 14,607 | 8,814 | 15,323 | 3,446 | 1,454 | 190,507 |
| 750– 1,000 | 9,441 | 41,911 | 81,575 | 29,285 | 41,484 | 16,883 | 7,832 | 14,024 | 1,622 | 2,296 | 246,353 |
| 1,000– 1,250 | 10,826 | 56,608 | 112,117 | 60,413 | 28,028 | 33,025 | 14,935 | 9,213 | 4,237 | | 329,402 |
| 1,250– 1,500 | | 38,656 | 113,370 | 67,350 | 74,227 | 36,971 | 31,290 | 11,305 | | 2,700 | 375,869 |
| 1,500– 2,000 | 9,003 | 50,176 | 217,399 | 168,775 | 198,659 | 88,503 | 63,289 | 68,265 | 8,609 | 12,088 | 884,766 |
| 2,000– 2,500 | 13,334 | 35,271 | 296,798 | 164,854 | 206,999 | 154,134 | 45,314 | 55,579 | 22,615 | 4,742 | 999,640 |
| 2,500– 3,000 | 8,693 | 29,164 | 138,196 | 148,075 | 223,540 | 148,205 | 46,178 | 95,674 | 30,073 | 17,026 | 884,824 |
| 3,000– 4,000 | 3,939 | 7,736 | 195,894 | 100,653 | 199,131 | 113,789 | 97,646 | 116,194 | 36,679 | 24,449 | 896,110 |
| 4,000– 5,000 | | 9,450 | 98,878 | 39,922 | 116,095 | 67,360 | 52,260 | 55,230 | 39,314 | 17,248 | 495,757 |
| 5,000– 7,000 | | | 73,158 | 52,781 | 47,766 | 71,976 | 38,566 | 48,346 | 45,082 | 51,003 | 428,678 |
| 7,000–10,000 | | | 15,870 | 31,780 | 17,462 | 31,994 | 19,772 | | 14,740 | 14,272 | 145,890 |
| 10,000–15,000 | 25,978 | | | 12,315 | 25,634 | 20,000 | 116,836 | 52,774 | | 42,980 | 296,517 |
| Over 15,000 | | | 119,857 | | 71,486 | | | 31,080 | | | 222,423 |
| Total | 126,211 | 334,404 | 1,560,084 | 908,670 | 1,273,426 | 802,047 | 546,354 | 574,728 | 206,899 | 190,258 | 6,523,081 |
| | **Total expenditures (dollars)** | | | | | | | | | | |
| $0– 500 | 40,223 | 25,422 | 59,961 | 17,007 | 8,272 | 5,877 | 3,572 | 1,787 | 504 | | 162,625 |
| 500– 750 | 20,972 | 41,915 | 54,417 | 20,358 | 16,973 | 17,368 | 10,898 | 16,911 | 3,245 | 1,353 | 204,410 |
| 750– 1,000 | 7,843 | 40,994 | 90,832 | 31,536 | 45,209 | 16,339 | 7,991 | 15,170 | 2,109 | 2,385 | 260,408 |
| 1,000– 1,250 | 9,812 | 56,551 | 113,574 | 67,893 | 29,721 | 33,347 | 14,998 | 9,071 | 4,108 | | 339,075 |
| 1,250– 1,500 | | 35,755 | 113,337 | 71,607 | 72,168 | 38,909 | 30,942 | 11,149 | | 2,684 | 376,551 |
| 1,500– 2,000 | 9,851 | 45,220 | 206,185 | 163,561 | 189,240 | 86,687 | 59,850 | 68,842 | 8,583 | 12,880 | 850,899 |
| 2,000– 2,500 | 8,890 | 28,424 | 288,627 | 155,224 | 202,955 | 153,998 | 42,580 | 56,372 | 23,598 | 10,330 | 970,998 |
| 2,500– 3,000 | 8,988 | 25,276 | 123,863 | 138,202 | 204,845 | 159,999 | 44,186 | 95,076 | 34,792 | 17,848 | 853,075 |
| 3,000– 4,000 | 3,251 | 5,268 | 173,199 | 81,465 | 171,713 | 102,171 | 90,050 | 112,104 | 38,506 | 23,922 | 801,649 |
| 4,000– 5,000 | | 8,786 | 82,460 | 40,959 | 107,694 | 64,082 | 45,016 | 50,208 | 39,209 | 18,628 | 457,042 |
| 5,000– 7,000 | | | 45,762 | 37,971 | 37,002 | 62,274 | 32,064 | 40,268 | 38,138 | 50,062 | 343,541 |
| 7,000–10,000 | | | 6,500 | 24,930 | 16,254 | 30,104 | 14,692 | | 15,190 | 10,274 | 117,944 |
| 10,000–15,000 | 14,096 | | | 4,689 | 7,810 | 20,220 | 91,646 | 38,676 | | 44,046 | 221,183 |
| Over 15,000 | | | 79,299 | | 40,194 | | | 28,676 | | | 148,169 |
| Total | 123,926 | 313,611 | 1,438,016 | 855,402 | 1,150,050 | 791,375 | 488,485 | 544,310 | 207,982 | 194,412 | 6,107,569 |

TABLE 5

Average Size of Families, 1941

| INCOME PER FAMILY GROUPS | NUMBER OF SCHEDULES Single | Family | NUMBER OF EQUIVALENT ADULTS Single | Family | AV. NO. OF EQUIVALENT ADULTS Single | Family | RATIO OF FAMILY TO SINGLE |
|---|---|---|---|---|---|---|---|
| $0– 500 | 181 | 243 | 159.3 | 523.8 | .88 | 2.16 | 2.45 |
| 500– 750 | 100 | 212 | 91.6 | 573.1 | .92 | 2.70 | 2.95 |
| 750– 1,000 | 59 | 226 | 55.7 | 576.9 | .94 | 2.55 | 2.70 |
| 1,000– 1,250 | 60 | 234 | 57.2 | 577.2 | .95 | 2.47 | 2.59 |
| 1,250– 1,500 | 28 | 246 | 27.6 | 639.0 | .99 | 2.60 | 2.64 |
| 1,500– 2,000 | 35 | 473 | 34.0 | 1,311.1 | .97 | 2.77 | 2.86 |
| 2,000– 2,500 | 22 | 425 | 20.8 | 1,153.4 | .94 | 2.71 | 2.87 |
| 2,500– 3,000 | 14 | 309 | 13.4 | 952.7 | .96 | 3.08 | 3.22 |
| 3,000– 4,000 | 3 | 258 | 2.8 | 807.1 | .93 | 3.13 | 3.35 |
| 4,000– 5,000 | 2 | 110 | 2.0 | 363.6 | 1.0 | 3.30 | 3.30 |
| 5,000– 7,000 | | 75 | | 280.0 | | 3.73 | |
| 7,000–10,000 | | 18 | | 64.2 | | 3.57 | |
| 10,000–15,000 | 2 | 23 | 1.6 | 97.1 | .80 | 4.22 | 5.28 |
| Over 15,000 | | 11 | | 28.8 | | 2.62 | |
| Total | 506 | 2,863 | 466.0 | 7,948.0 | .921 | 2.776 | 3.014 |

## 5 CLASSIFICATION METHODS AND THE DISTRIBUTION OF INCOME

What effect does shifting from one method of classification to another have on the apparent concentration of income? The simplest method of comparing two distributions is probably the Lorenz curve. Tables 6 and 7 show the data in the cumulative percentage form required for Lorenz curves. Table 6 shows the figures that result from classification by per capita income and expenditure. Table 7 shows the figures that result from a classification by family income, and also those that appear when the classification by family is modified by placing single individuals in the income group occupied by families having 2.5 times as much income.

Economic inequality can be expressed in a large variety of ways. In fact, three factors are involved: the method of classification (family income, per capita income, per capita expenditure, family wealth, or some other index of economic status), the economic quantity whose distribution is being studied (income, wealth, expenditure, or some other measure of economic power), and the measure of the population used (the person, the family, the equivalent adult, or some other measure of relative importance of the various economic units).

TABLE 6

Sample Cumulative Percentage Distribution of Schedules, Equivalent Adults, Income, Expenditures, and Savings by Income and Expenditure per Equivalent Adult, 1941

| | CUMULATIVE PERCENTAGES OF TOTAL ABOVE GIVEN LEVEL | | | | |
|---|---|---|---|---|---|
| | NUMBER OF | | MONEY | | |
| INCOME PER EQUIVALENT ADULT LEVELS | Schedules | Equivalent adults | Income | Expenditures | Savings |
| Negative | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| $0 | 99.94 | 99.96 | 100.00 | 99.94 | 100.96 |
| 200 | 90.86 | 90.45 | 98.32 | 97.74 | 106.86 |
| 300 | 83.32 | 82.65 | 95.79 | 94.92 | 108.49 |
| 400 | 74.62 | 73.21 | 91.48 | 89.99 | 113.38 |
| 500 | 66.46 | 64.02 | 86.07 | 83.95 | 117.30 |
| 600 | 56.75 | 53.77 | 78.78 | 75.94 | 120.57 |
| 700 | 48.15 | 45.30 | 71.73 | 68.51 | 118.95 |
| 800 | 39.63 | 36.28 | 63.05 | 59.40 | 116.56 |
| 900 | 32.56 | 29.05 | 55.15 | 51.06 | 115.22 |
| 1,000 | 26.62 | 23.24 | 48.09 | 44.02 | 107.90 |
| 1,200 | 17.24 | 14.51 | 35.85 | 31.98 | 92.68 |
| 1,500 | 9.35 | 7.71 | 24.15 | 20.50 | 77.73 |
| 2,000 | 4.54 | 3.68 | 15.53 | 12.24 | 63.85 |
| 3,000 | 1.42 | 1.21 | 7.78 | 5.55 | 40.52 |
| 5,000 | .33 | .26 | 3.33 | 2.19 | 20.13 |
| EXPENDITURE PER EQUIVALENT ADULT LEVELS | | | | | |
| $0 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| 200 | 91.72 | 91.14 | 98.34 | 98.27 | 99.32 |
| 300 | 83.68 | 82.98 | 95.54 | 95.43 | 97.11 |
| 400 | 75.54 | 73.84 | 91.28 | 91.06 | 94.46 |
| 500 | 65.95 | 63.89 | 85.18 | 84.90 | 89.32 |
| 600 | 56.52 | 53.48 | 77.43 | 77.00 | 83.73 |
| 700 | 46.30 | 42.84 | 67.90 | 67.52 | 73.47 |
| 800 | 37.40 | 33.67 | 58.52 | 58.06 | 65.28 |
| 900 | 29.80 | 25.94 | 49.70 | 49.05 | 59.22 |
| 1,000 | 23.51 | 20.03 | 42.18 | 41.35 | 54.41 |
| 1,200 | 14.48 | 12.01 | 30.76 | 29.44 | 50.19 |
| 1,500 | 8.04 | 6.59 | 20.65 | 19.45 | 38.32 |
| 2,000 | 2.79 | 2.17 | 9.74 | 8.97 | 20.99 |
| 3,000 | .86 | .70 | 4.89 | 4.28 | 13.92 |
| 5,000 | .15 | .09 | 1.71 | 1.26 | 8.28 |

TABLE 7

Sample Cumulative Percentage Distribution of Schedules, Equivalent Adults, Income, Expenditures, and Savings by Family Income Groups, Unadjusted and with Single Person Adjustment,[a] 1941

| FAMILY INCOME LEVEL UNADJ. | | CUMULATIVE PERCENTAGES OF TOTAL ABOVE GIVEN LEVEL NUMBER OF Schedules | Equivalent adults | MONEY Income | Expenditures | Savings |
|---|---|---|---|---|---|---|
| Negative | | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| $0 | | 99.94 | 99.96 | 100.00 | 99.94 | 100.96 |
| 500 | | 87.42 | 91.89 | 98.06 | 97.34 | 108.73 |
| 750 | | 78.25 | 83.99 | 95.14 | 93.99 | 112.08 |
| 1,000 | | 69.69 | 76.47 | 91.37 | 89.73 | 115.46 |
| 1,250 | | 60.97 | 68.89 | 86.32 | 84.18 | 117.79 |
| 1,500 | | 52.84 | 60.98 | 80.55 | 78.01 | 117.95 |
| 2,000 | | 37.71 | 45.00 | 66.99 | 64.08 | 109.80 |
| 2,500 | | 24.49 | 31.05 | 51.67 | 48.18 | 102.91 |
| 3,000 | | 14.90 | 19.57 | 38.10 | 34.21 | 95.27 |
| 4,000 | | 7.15 | 9.95 | 24.36 | 21.09 | 72.53 |
| 5,000 | | 3.83 | 5.60 | 16.76 | 13.60 | 63.22 |
| 7,000 | | 1.60 | 2.28 | 10.19 | 7.98 | 42.73 |
| 10,000 | | 1.07 | 1.52 | 7.96 | 6.05 | 36.00 |
| 15,000 | | .33 | .34 | 3.41 | 2.43 | 17.87 |
| FAMILY INCOME LEVEL ADJ.[a] | NO. OF SCHEDULES ADJ.[b] | | | | | |
| Negative | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| $0 | 99.94 | 99.94 | 99.96 | 100.00 | 99.94 | 100.96 |
| 500 | 91.32 | 91.07 | 93.17 | 98.71 | 98.22 | 105.87 |
| 750 | 83.90 | 83.64 | 85.96 | 96.59 | 95.72 | 109.36 |
| 1,000 | 75.83 | 75.33 | 78.55 | 93.31 | 91.84 | 115.01 |
| 1,250 | 67.79 | 67.47 | 71.32 | 89.08 | 87.09 | 118.33 |
| 1,500 | 59.16 | 58.80 | 63.24 | 83.53 | 81.08 | 119.57 |
| 2,000 | 42.88 | 42.83 | 46.95 | 70.18 | 67.33 | 112.12 |
| 2,500 | 28.39 | 28.79 | 32.70 | 54.94 | 51.36 | 107.57 |
| 3,000 | 17.66 | 18.14 | 20.82 | 41.11 | 37.07 | 100.49 |
| 4,000 | 8.62 | 9.05 | 10.67 | 26.54 | 23.06 | 77.63 |
| 5,000 | 4.70 | 5.05 | 6.07 | 18.41 | 15.06 | 67.72 |
| 7,000 | 1.83 | 1.84 | 2.36 | 10.65 | 8.41 | 43.58 |
| 10,000 | 1.16 | 1.13 | 1.54 | 8.10 | 6.19 | 36.16 |
| 15,000 | .38 | .39 | .36 | 3.81 | 4.08 | 20.73 |

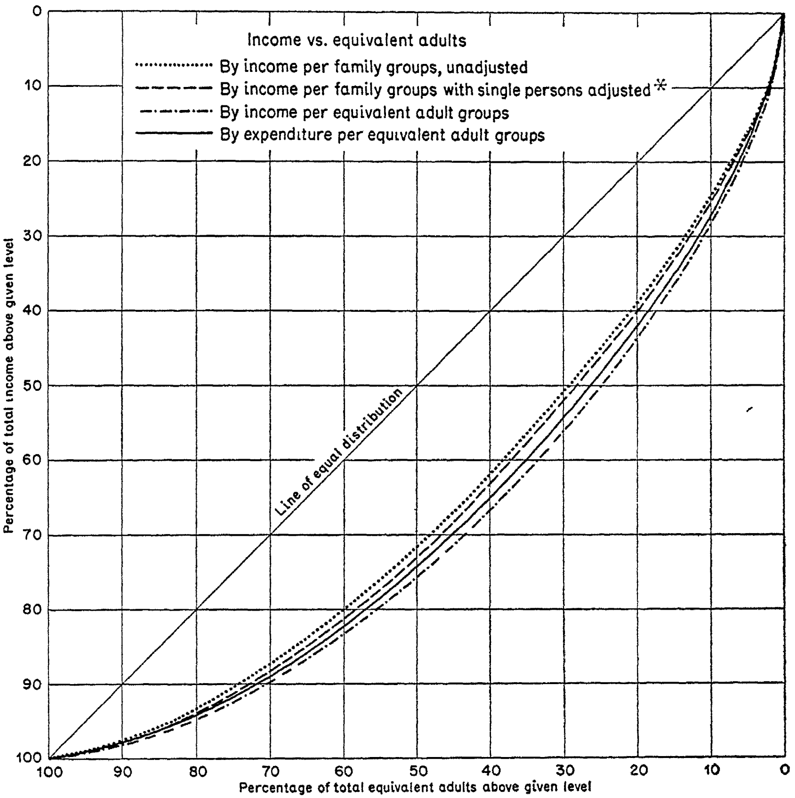
[a] Single persons included with families having incomes 2.5 times as great.
[b] Each single schedule counted as 0.4.

Chart 1 shows how the method of classification affects the results. The upper curve, showing the least concentration, is the result obtained when family income is the basis of classification — the top 50 percent of the population has 71.2 percent of the income. If an adjustment is made to include single per-

CHART 1

**Effect of the Classification of Families on the Distribution of Income**

Lorenz Curves of Income vs. Equivalent Adults; Classified by Income per Family, by Income per Family with Single Persons Shifted Upwards*, by Income per Equivalent Adult, and by Expenditure per Equivalent Adult




* Single persons grouped with families having incomes 2½ times as great.

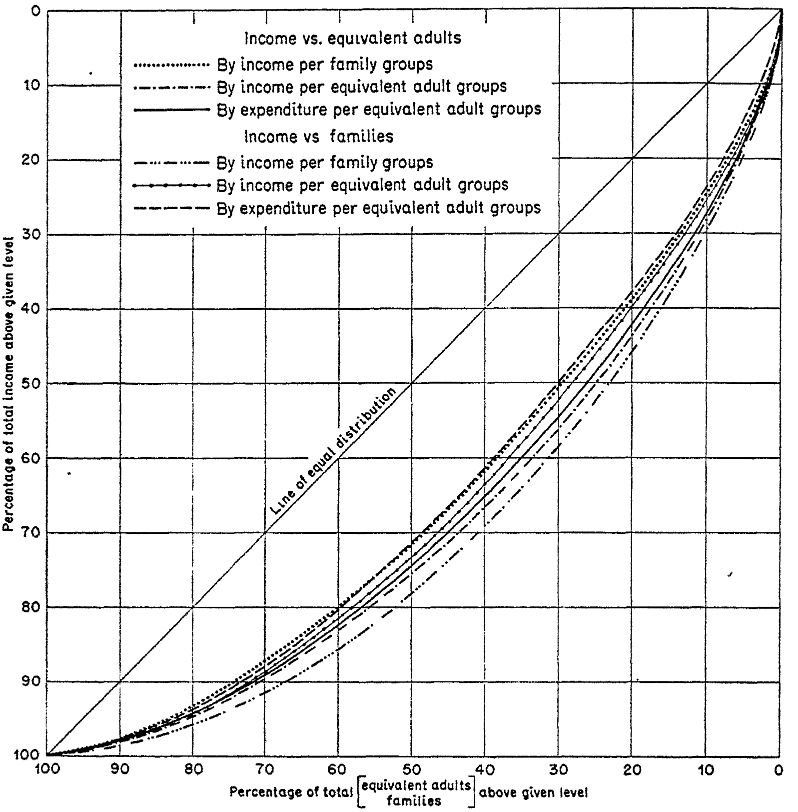
sons in the group with families having 2.5 times as much income, the second curve is obtained — this top 50 percent of the population gets 72.8 percent of the income. If we classify families according to income per equivalent adult, the lowest curve is obtained — this top 50 percent of the population gets 75.6 percent of the income. Finally, if we classify families by expenditure per equivalent adult, the top 50 percent of the equivalent adults get 73.8 percent of the income.

Chart 2 shows how the indicated inequality is affected by the unit chosen to measure the population. The lowest line, indi-

CHART 2

**Effect of the Unit by which Population Is Measured on the Distribution of Income**

Lorenz Curves of Income vs. Equivalent Adults Compared with Curves of Income vs. Families; Classified by Income per Family, by Income per Equivalent Adult, and by Expenditure per Equivalent Adult



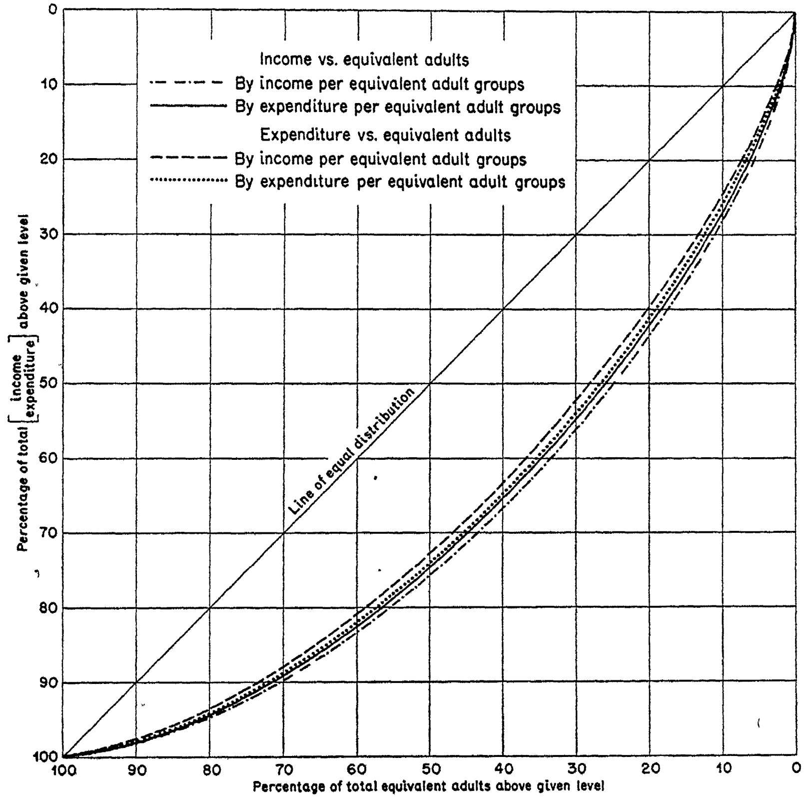

cating the greatest concentration, is the result obtained when income per family is the basis of classification and the percentage of income is plotted against the percentage of families. Using the same classification but plotting income against number of equivalent adults gives a markedly more equal distribution — as indicated by the dotted line. The spread between the income versus equivalent adult curve and the income versus family curve is much narrower for data classified by income per equivalent adult; also in this case it is the income versus equivalent adult curve that indicates the greatest inequality.

Chart 3 shows the difference between using expenditure and income as a basis for classification. The distribution is most unequal when the distribution of income is by income groups, and least unequal when the distribution of expenditure is by income groups. When expenditure groups are used, it makes only a slight difference whether the distribution of income or of expenditure is considered.

CHART 3

**Effect of the Unit by which Resources Are Measured on the Distribution Picture**

Lorenz Curves of Income vs. Equivalent Adults Compared with Curves of Expenditure vs. Equivalent Adults; Classified by Income per Equivalent Adult and by Expenditure per Equivalent Adult

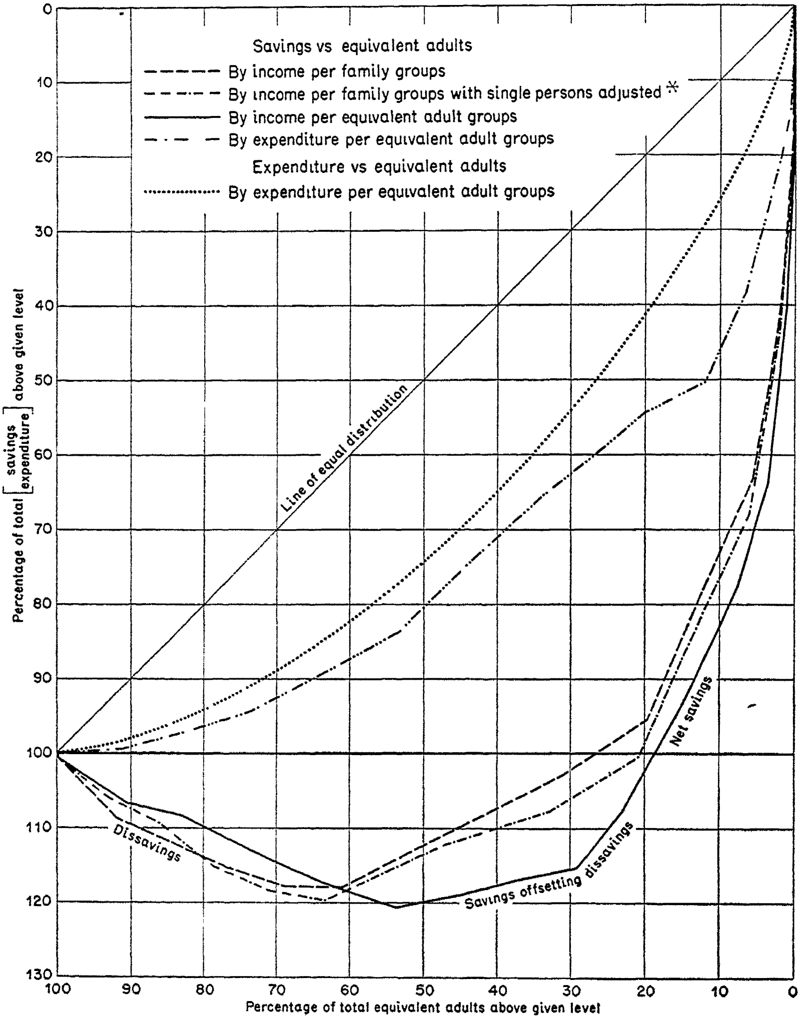



The most striking effect of methods of classification is found in Chart 4. For comparison, the distribution of expenditure by expenditure per equivalent adult is also shown. When the classi-

CHART 4

**Effect of the Classification of Families on the Distribution of Savings**

Lorenz Curves of Savings vs. Equivalent Adults; Classified by Income per Family, by Income per Family with Single Persons Shifted Upwards*, by Income per Equivalent Adult, and by Expenditure per Equivalent Adult; and of Expenditure vs. Equivalent Adults by Expenditure per Equivalent Adult




* Single persons grouped with families having incomes 2 ½ times as great.

fication is by income, nearly the whole lower half of the population have dissavings or negative savings, and the actual net savings of the country are accounted for by the top 18–27 percent. On the other hand, when the classification is by per capita expenditure, there are no dissavings at the bottom of the scale and the distribution of savings is only moderately more unequal than that of expenditures.

## 6 Classification Methods and the Propensity to Consume

Such striking differences in the apparent distribution of savings suggest strongly that corresponding differences may occur in the marginal propensity to consume and the marginal propensity to save as computed from these figures. The marginal propensity to consume is defined as the percentage of an increase in disposable income that would be spent by a given income group. The usual method of estimating the marginal propensity to consume at various income levels is to assume that if the members of one income group were to have their disposable incomes increased to the average disposable income of the next higher group, they would on the average increase their expenditures to the present expenditure level of the higher income group. The procedure then is to take the difference between the average expenditure of the successive groups and divide by the corresponding difference between their average disposable incomes.

This procedure clearly is relevant only to a long run propensity to consume: that is, it measures what individuals would do with a permanent increase in disposable income after having adjusted themselves to the change. Or by stretching the relevance a bit, it could indicate the disposition of a temporary increase in income provided we consider not the disposition made in the immediate period but the ultimate disposition of this added economic power over a long enough period.

Obviously, only rarely will a temporary increase in income be spent immediately; most of it will be saved, at least for a brief period. But this saving may not be permanent: much of the larger income may be spent after a shorter or longer interval, and only a relatively small amount retained permanently as

capital. If a suitably long period, probably five years or more, were allowed for determining what is to be done with the added income, the disposal in such a period might be considered to correspond fairly well with the marginal propensity to consume.

However, a classification by annual income is inappropriate for deriving a propensity to consume by this method, for this method presupposes that the average income and expenditure of persons in the various groups is typical of those who are permanently at such a level of income. Actually, as we have seen, the top income groups contain relatively more persons with temporarily large incomes and who accordingly have more savings than persons who receive steady incomes at these levels. Conversely, the lower income groups contain many persons with temporarily impaired incomes who have smaller savings and greater dissavings than persons permanently at these lower income levels. Accordingly, differences in savings corresponding to given differences in incomes are greater than they would be were the various groups to include only persons permanently at the various income levels, and the marginal propensity to save is overestimated and the marginal propensity to consume correspondingly underestimated.

There is on the whole good reason to believe that a marginal propensity to consume derived from a distribution classified by per capita expenditure would be closer to the theoretical long run curve than one derived from an income classification. Annual expenditure is likely to be much more stable from year to year than annual income, and the average savings of a given expenditure group is likely to be much closer to the average savings of families who remain steadily at that average level of income and expenditure than the average savings of the corresponding income group. In other words, there is a high correlation between the annual savings of given families in different years and their annual incomes, and this correlation produces a higher estimate of marginal propensity to save than would a comparison of the average savings of different families at different average income levels.

Table 8 and Chart 5 compare the marginal propensity to consume as estimated from various sources. Though the National Resources Committee data for 1935–36 are practically obsolete and rest on a relatively small sample that must be

TABLE 8

Marginal Propensity to Consume as Derived from Various Tabulations

*1935–1936 NRC Family Data*

| DISPOSABLE INCOME PER FAMILY (1941 $) | MARGINAL PROPENSITY TO CONSUME | DISPOSABLE INCOME PER FAMILY (1941 $) | MARGINAL PROPENSITY TO CONSUME |
|---|---|---|---|
| $452 | .775 | $13,930 | .549 [a] |
| 758 | .859 | 19,170 | .211 [a] |
| 1,007 | .888 | 23,890 | .380 |
| 1,258 | .808 | 29,440 | .356 |
| 1,508 | .824 | 37,310 | .335 |
| 1,758 | .827 | 52,600 | .310 |
| 2,063 | .759 | 85,350 | .215 |
| 2,513 | .715 | 159,500 | .128 |
| 3,104 | .666 | 310,800 | .099 |
| 3,941 | .593 | 771,200 | .074 |
| 5,580 | .512 | (15,570 | .405 [a]) |
| 8,870 | .408 | | |

*1941 BLS–BHNHE Tabulations*

| ALL FAMILY UNITS | | URBAN FAMILY UNITS | |
|---|---|---|---|
| Disposable income per family | Marginal propensity to consume | Disposable income per family | Marginal propensity to consume |
| $790 | .868 | $676 | .779 |
| 1,232 | .836 | 1,111 | .980 |
| 1,696 | .832 | 1,617 | .789 |
| 2,276 | .954 | 2,120 | 1.040 |
| 3,239 | .732 | 2,642 | .918 |
| | | 3,384 | .750 |
| | | 4,991 | .652 |
| | | 9,398 | .606 |

*Sample Tabulations of Nonfarm Schedules, 1941*

| BY FAMILY INCOME GROUPS | | BY INCOME PER EQUIVALENT ADULT GROUPS | | BY EXPENDITURE PER EQUIVALENT ADULT GROUPS | |
|---|---|---|---|---|---|
| Income per schedule | Marginal propensity to consume | Income per schedule | Marginal propensity to consume [b] | Income per schedule | Marginal propensity to consume [b] |
| $515 | .911 | $587 | .930 | $617 | .941 |
| 919 | .944 | 1,095 | .998 | 1,127 | .943 |
| 1,492 | .830 | 1,578 | .845 | 1,662 | .906 |
| 2,095 | .983 | 2,003 | .888 | 2,097 | 1.035 |
| 3,089 | .783 | 2,455 | .795 | 2,487 | .937 |
| 4,955 | .649 | 3,078 | .838 | 3,359 | .799 |
| 9,019 | .684 | 4,144 | .622 | 4,442 | .931 |
| 16,040 | .553 | 6,325 | .504 | 6,756 | .852 |
| | | 13,800 | .560 | 15,470 | .619 |

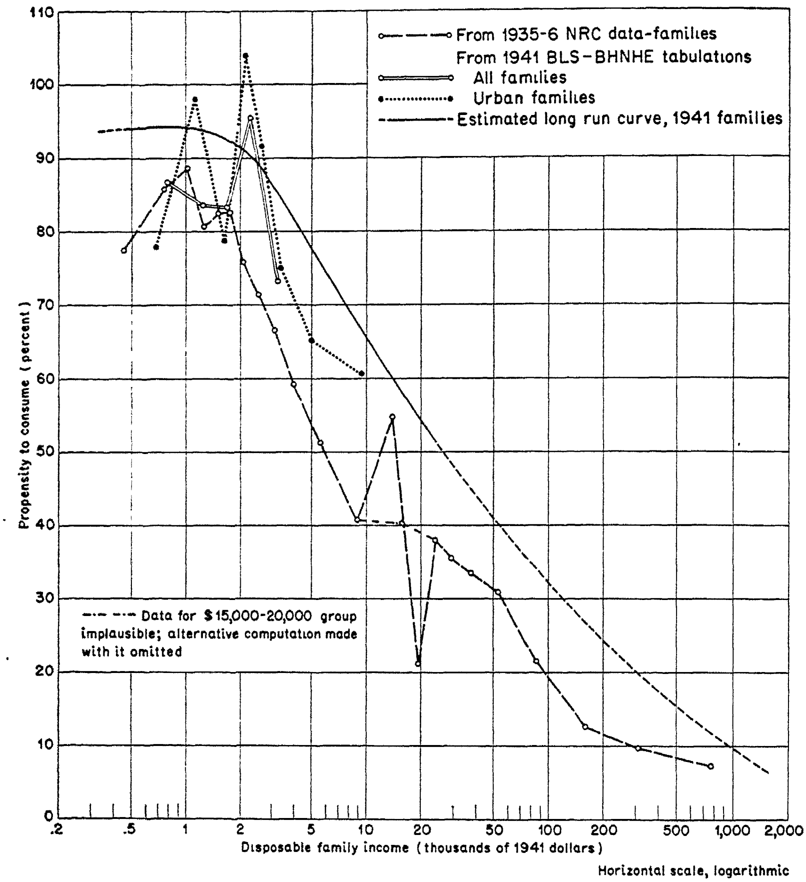
[a] Data for $15,000–20,000 group implausible; alternative computation made with this group omitted.

[b] Computed from differences in income and expenditure per equivalent adult.

CHART 5

**Marginal Propensity to Consume**

A. From Earlier Tabulations

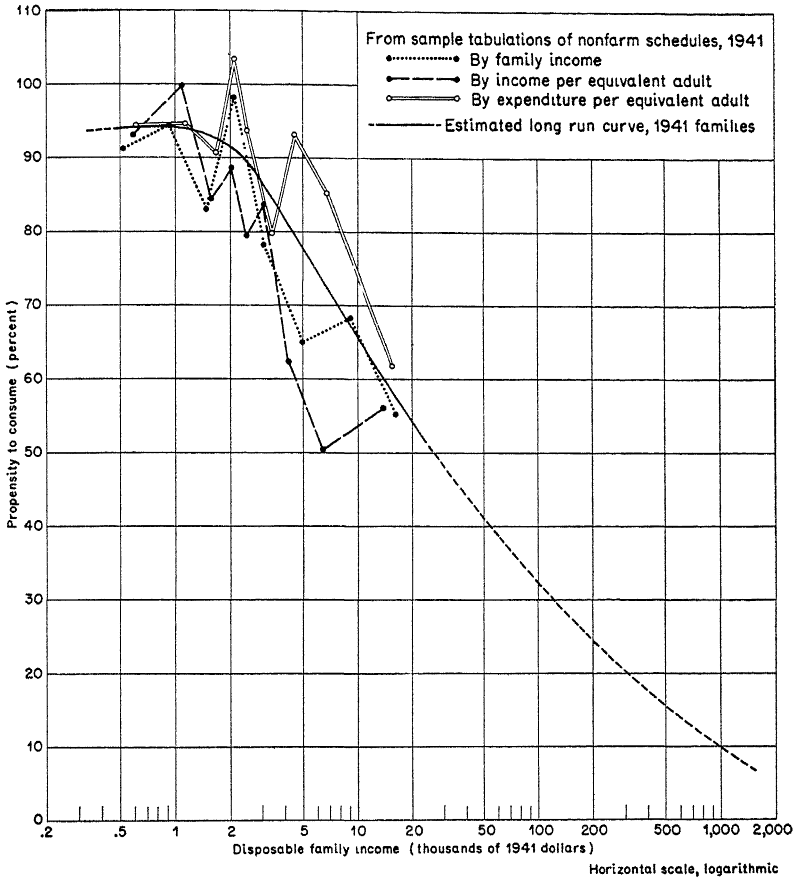



considered open to wide margins of error, they afford the only estimates in the upper ranges of income. The two estimates from the data for the $15,000–20,000 group are out of line in a way that strongly suggests a blunder of some sort in the figures. One estimate is derived from the total figures of the 1941 Study of Family Spending and Saving in Wartime and another from those for urban families only, as the urban figures are for higher income groups. Finally, three estimates are shown derived from the sample treated here: as derived from a classification by (1) family incomes, (2) income per equivalent adult, and (3) expenditure per equivalent adult.

CHART 5 (concl.)

Marginal Propensity to Consume

B. From Present Tabulations




The figures in Table 8 are of course not all exactly comparable. In the 1935–36 figures, the disposable income levels have been adjusted upward to correspond to 1941 price levels. In the 1935–36 figures and in the figures derived from the BLS-BHNHE studies for 1941, the propensity to consume is the ratio between changes in consumption and in consumption-plus-savings; personal gifts are not considered on the ground that their ultimate disposition will depend upon the action of the donee. However, the abscissa for plotting purposes is the disposable income including gifts, i.e., net income less personal taxes.

As no figures in the sample tabulations were available for taxes or gifts, they are in effect included in 'savings'. The difference is probably negligible except at the top of the scale; in any case the three propensities computed from these data are comparable in this respect.

In each instance the abscissa against which the marginal propensity is plotted is the geometric mean of the average (disposable) incomes of the two groups between which the marginal propensity to consume was computed.

The curve for an estimated long run marginal propensity to consume is conceptually the result of adjusting the curve obtained from the total figures by family income groups as given by the BLS–BHNHE study for 1941 according to the difference between the figures derived from the family income classification of the present sample and those derived from the classification by per capita expenditures. The figures for urban families in the BLS study and the figures from the 1935–36 study were used as a guide in extrapolating the curve beyond the upper limit of these basic figures. It will be appreciated that this curve is subject to a wide margin of error, particularly in the upper ranges. Indeed, computing a marginal propensity to consume from the detailed figures in Tables 7 and 8 gave such erratic fluctuations that it was necessary to combine the groups in order to produce intelligible results; it thus appears that the basic data are subject to large random fluctuations. And in the upper income ranges the estimated curve is not only based upon doubtful data but also is obtained by rather drastic extrapolation procedures. Nevertheless, the curve is a definite improvement over figures derived solely from data classified by family income.

While it may be fairly clear that a classification by annual expenditure gives a closer approximation to the long run marginal propensity to consume than a classification by annual income, annual expenditure does vary from year to year and so fails to rank individuals accurately according to their long run economic status. We may thus enquire whether there are theoretical grounds for believing that the true long run marginal propensity to consume is higher or lower than the estimates based upon a classification by annual expenditure.

The answer depends fundamentally upon whether variations

from year to year in the savings of given individuals are positively or negatively correlated with variations in expenditures. If savings of given individuals tend to be higher than usual in years of higher expenditures, the average savings in the higher annual expenditure groups will be higher than the savings of persons who have steady expenditures of this amount. Indeed, the average savings of these groups will also be greater than the average savings of persons who have fluctuating expenditures but whose average expenditures equal the average expenditure of the group. Thus whether we take as the hypothetical norm persons having steady expenditures or merely want the average savings for a period of years of persons having given average expenditures, the inequality of the distribution of savings will be exaggerated, and likewise the marginal propensity to save will appear too large and the marginal propensity to consume correspondingly too small. Conversely, if there is a negative correlation between expenditure and savings the propensity to consume will be overestimated.

Fluctuations in annual expenditures per equivalent adult arise from two principal sources: changes in needs and in incomes. When the fluctuations arise from changes in income, it is reasonable to suppose that the change in expenditure will be less, and that accordingly the savings will vary in the same direction as the income and the expenditure. On the other hand, when changes in expenditure arise independently of changes in income, e.g., through expenses arising from illness, retirement, taking a long vacation, providing higher education for children, the purchase of durable consumer goods, moving from one location to another, or equipping a newly established household, savings probably vary inversely with expenditure. Moreover, any change in family need due to changes in the size of family and not reflected in the factor used to measure the size of family will also cause variations in savings to be negatively correlated with expenditure. For example, if we were to classify by family expenditure rather than by per capita expenditure, then within each class one would find varying levels of economic welfare, depending on variations in family size; one would expect to find the higher family expenditure groups relatively overloaded with families that are (temporarily or otherwise) large and that may have relatively low savings (compared to

what would be the case were the familes all to remain constant in size), while the lower family expenditure groups would conversely be overloaded with small families having small expenditures by reason of small needs rather than small income and accordingly having unusually large savings. Whether the propensity to consume is over- or underestimated by the use of an expenditure classification will depend on whether changes in consumption are more closely related to such changes in needs as are not reflected in the method of classification or to changes in resources.

On the whole it seems probable that in contemporary circumstances and for a classification that takes family size into consideration changes in income affect expenditures more than changes in other factors influencing consumer needs, and that accordingly savings and expenditures of given individuals in different years are positively rather than negatively correlated, and the marginal propensity to consume obtained from data classified by expenditure per equivalent adult is too low rather than too high. This conclusion, however, rests only on speculation: no data are as yet available that would permit its verification.

While it may be admitted that a classification by consumption per equivalent adult may produce a closer approximation to the long run marginal propensity to consume, if a short run propensity to consume is wanted, the figure produced by using data classified by annual income may be more appropriate. For example, it may be desired to know how much of a given tax increase will come out of savings in the period immediately following its imposition, say a year, rather than in the long run.

However, there is actually nothing in the annual income classification that will ensure this result. What we obtain from this classification is an average of short and long run 'propensities with unspecified weights given to the propensities for the varying periods, not a short run propensity to save. The various income groups include not only individual families with varying incomes but also families whose income is steady for longer or shorter periods. Thus it cannot be said that the 'propensity to save' figure obtained from such data pertains to a year merely because the basis for classification is the income for one year; nor can it even be said that such a figure pertains to any de-

terminable period at all, as there is no way of telling what the 'average' period of income fluctuation is.

Similar reasoning applies when the problem is to determine the marginal propensity to spend on specific items of consumption. For instance, if it is required to determine what the total expenditure for food is likely to be at a given level and distribution of national income, figures derived from a classification by expenditure groups are likely to yield a more unbiased answer. If, for example, the income is assumed to double, but the price level and the distribution remain the same, judging the consumption of the future $2,000–3,000 group on the basis of the consumption of the present $2,000–3,000 group will lead to a biased result, for the future group will contain a larger proportion of temporarily depressed incomes; in fact, if the fluctuation patterns are preserved, it may be expected that the proportion of depressed incomes will be more nearly comparable with that in the present $1,000–1,500 group. By minimizing the effect of income fluctuations, a classification by expenditure groups should greatly reduce the bias in any such estimates.

## 7 Classification and the Distribution of the Tax Burden

The proper classification of families is also of great importance when we come to estimate the distribution of the tax burden and particularly when an attempt is made to compare the progressivity of types of tax. Actually, if the tax base is closely correlated with the measure used for classification, the progressiveness or regressiveness of the tax may be exaggerated; on the other hand, if the tax base varies in large degree independently of the classification measure, a spurious appearance of regressivity may result. Moreover, these biases do not necessarily depend upon the relation of the basis for classification to the standard of ability to pay adopted as a criterion for progression.

For example, consider a community of six individuals, of which A, B, and C have average incomes of $4,000 and steady annual expenditures of $3,600, A having a steady income of $4,000, B having in the current year an income of $3,000 and in alternate years an income of $5,000; while C's income is currently $5,000 and $3,000 in alternate years. Similarly, D,

E, and F have average incomes of \$3,000, and annual expenditures of \$2,700, D having a steady \$3,000 income, E \$2,000 in the current year and \$4,000 in alternate years, while F has an income of \$4,000 in the current year and \$2,000 in alternate years. If now we impose a flat 10 percent tax on expenditure, and classify individuals according to whether their current income is above or below \$3,500, then A, C, and F will fall in the top group and pay a tax of \$990 on an expenditure of \$9,900 out of a total income of \$13,000. Measured against expenditure, the tax is of course 10 percent, but measured against income the tax is 7.6 percent. On the other hand B, D, and E will fall in the lower group and pay a \$900 tax on a total expenditure of \$9,000, out of a total income of \$8,000, or 11.2 percent. Thus the burden expressed in terms of the relation of tax to income looks regressive. Actually if we classify the taxpayers on the basis of their average income or expenditure, A, B, and C will be in the top group and pay \$1,080 on an expenditure of \$10,800 out of an income of \$12,000, while D, E, and F will pay a tax of \$810 on an expenditure of \$8,100 out of an income of \$9,000. In both cases the burden is 9 percent of income or 10 percent of expenditures, and the tax is actually proportional. Nor will the consideration of the alternate years correct this bias: for then A, B, and E will be in the bottom group, and the distribution of the tax burden will be the same as in the current year. Thus a classification by annual income exaggerates the regressiveness of sales and expenditure taxes.

On the other hand, if we look at the effect on the apparent progressiveness of the income tax, the reverse is true. If, for example, we have an income tax of 40 percent on income in excess of \$3,500, the top annual income group will pay \$1,000 on income of \$13,000 while the lower group will pay nothing; however, on the average A, B, and C will pay \$800 per year on income amounting to \$12,000, while D, E, and F will pay \$200 per year on income amounting to \$9,000. On an annual basis the relative burdens seem to be 7.7 percent and zero; on the average, they turn out to be 6.7 and 2.2 percent. Thus it is apparent that the relative tax burdens computed from data derived from tabulations classified by annual income must be accepted only with reservations. Unfortunately, no data are available that would permit any close readjustment of tax burden figures.

## 8 Summary

For the study of the welfare of families, the distribution of the tax burden, propensity to consume, and many other aspects of the distribution of resources and patterns of expenditure, data based on a classification of families by expenditure per equivalent adult are evidently better suited than present classifications by family income, or even than by income per equivalent adult. Even if no close agreement is to be had on the relative weights to be assigned different members of the family, any weighting, no matter how crude, is vastly better than no adjustment for family size. Refusing to make any adjustment merely because no close agreement is to be had recalls the well-known donkey that starved to death through not being able to decide between two bales of hay.

The classification scheme adopted need not be as elaborate as that adopted for the 1934–36 wage earner study; in fact, a simpler scheme is preferable not only to permit simple exposition but also to make comparison possible with other studies in which the data are collected in less detail. It is to be hoped that in any future studies of savings and consumption patterns and size distributions of incomes there will be included in the tabulation program the production of extensive data by expenditure per equivalent adult particularly, and possibly also by income per equivalent adult.

## *COMMENT*

Simon Kuznets

These comments on *Savings and the Income Distribution* are an attempt to push the interpretation of the interesting analysis beyond the limits set by the paper itself. Such an attempt may violate canons of legitimate scientific inference, and neglect the cautions, wisely indicated by the authors, as to possible errors in the sample data. But in a field in which empirical analysis has progressed so little, it seems advantageous to advance hypotheses on the basis of inadequate evidence, not as firm conclusions but as guides to further exploration; noting carefully, however, the limitations upon the validity of the hypotheses the data indicate.

## 1 Meaning of the Charts

In both the upper and lower panels of each chart the $Y$ scale is arithmetic for percentages that savings constitute of money income. In the upper panels of the charts, the $X$ scale is in logarithms of dollar money income per family. In the lower panels, with the single exception of Chart 4, the $X$ scale is in logarithms of the difference between the percentile of income and 100. For example, if a given family's income is $7,000, and such income places the family at the 93d percentile in the array, its place on the $X$ axis will be determined by laying off the log of $(100 - 93)$ from a given fixed point on the right side of the chart.[1] If another family's income is $5,000 and it is at the 60th percentile, its position will be determined by the log of $(100 - 60)$; and the segment on the $X$ scale between the two families will be measured by (log of $40$ − log of $7$).

The stability of the savings pattern for different income populations at a given time or for the same population at different times is derived on the basis of the lower panels. To bring out more clearly the meaning of the lower panel patterns let us assume that in every chart the pattern is a straight line along the whole range. If in every chart the straight lines for the income populations distinguished were identical, i.e., if they coincided at every observed point, what would this identity of lines mean? If they diverged, what would their divergence as to either level or slope signify?

Identity would mean that at the same percentile of income, the percentage of money income saved is exactly the same for the several income population groups, although the dollar levels of the percentile incomes may be quite different from one population group to the next. To use Chart 1 as an illustration, coincidence of the lines in the lower panel would mean that at the 20th or 90th percentile of income, the percentage of money income saved is exactly the same in the family population of metropolises, of large cities, of small cities, etc. In other words, even though the family at the 90th percentile of income in the large cities group may have an income of $7,000, and the family at the 90th percentile of income in the villages may have an

[1] The fixed point at the right side of the $X$ axis will be not at the log $(100 - 100)$, which is indeterminable, but at the log of some value within the bracket exceeding $O$.

income of only $4,000, the proportion of income saved by the latter would equal the proportion of income saved by the former.

If the lines on the lower panels for the several income populations compared fail to coincide, the differences may lie in the level, in the slope, or in both. To take the simpler case first, the straight lines descriptive of the savings pattern for the several income populations may show the same slope but differ in their average level. This would mean that at the same percentile of income, the proportion of money income saved in one income population is higher than the proportion saved in the other populations; and that the absolute difference in the savings ratios is constant through the whole range of the several distributions. There is some indication of that type of relation between the lines on Chart 5 for farm families (between the 50th and 98th percentiles) and on Chart 1 for nonfarm families. With this difference in *level*, similarity or identity of *slope* would mean that the absolute decline in the savings percentage per unit of relative additions to the distance of the percentile position from the peak of the income distribution is the same in the several distributions. The $X$ scale is in logarithms of the difference between 100 and the percentile of income, i.e., in logs of the distance between the percentile position and the peak; and *absolute* additions to these logs represent *relative* additions to the distance of the percentile position from the peak.

Correspondingly, a difference in slope (which may or may not be accompanied by differences in *average* level) would mean a different rate of absolute decline in the percentage of money income saved per unit of relative addition to the distance of the percentile position from the peak. A steeper slope would mean that the absolute decrease in the savings percentage per unit of relative addition to the distance of the percentile position from the peak is greater; in other words, that as the distance in percentile position increases one-tenth (say from the 90th to the 81st percentile or from the 60th to the 54th), the savings ratio drops off more than it does for a similar change in the percentile position in another distribution. With a milder slope there is a smaller falling away in the savings ratios, as we increase the relative distance of the percentile position from the peak.

If we know what a difference in slope means, it is easy to see

what a curved line would mean, since it could be resolved into a combination of straight lines with slopes changing from one part of the chart to another. There is, in fact, a tendency of the slopes to be steeper in the extreme left and right sections of the lower panels (most clearly shown in Chart 1). This means that at the very peak of the income distribution, as well as at the very bottom, equal relative additions to the distance from the peak seem to cause larger drops in the savings ratio than if the additions were in the middle sections of the distribution (between the 40th and 90th–95th percentiles).

What has been said about the meaning of coincidence, or differences in the level and slope of the lines in the lower panels, can be repeated about the lines in the upper panels, with one change: the percentage of money income saved is related to the logarithm of the dollar level of income, not to that of the distance of its percentile position from the peak. Coincidence of the lines for the different populations would mean, then, that the percentage of money income saved is the same at the same dollar levels of family incomes. A higher level would mean that the percentage of income saved, at any given dollar level of income, is higher; a steeper slope that, per unit of relative increase in the dollar level of family income, the absolute additions to the percentage of income saved are greater.

## 2 Relation to Group Savings Ratios

The relation of the savings pattern that appears in either the lower or the upper panels to the percentage of money income saved by the whole group whose distribution is studied is of obvious importance. Does coincidence of the pattern lines for the several income populations included necessarily mean that the over-all savings ratios are the same for all income populations? In terms of Chart 1, were the lines in either the upper or lower panels to coincide, would it mean that the proportion of money income saved by all the families in small cities is identical with the proportion saved by all the families in middle-sized cities, villages, etc. — the over-all ratio for each group being the ratio of total savings to total income?

There is no inherent relation between the coincidence of the lines in either the upper or the lower panels and the equality of

group-savings ratios; and no such relation could be established as long as the $X$ scale is in terms of *ordinal* income values and as long as we deal with distributions as final sums of discrete values.

Let us assume that, in the lower panel, the lines for two income populations coincide. As long as the two lines are treated as sums of discrete, finite sections, rather than as continuous and infinitely divisible paths, there may still be a significant difference between the average level of the line and the group-savings ratio derived as a ratio of all savings to all incomes. This can be illustrated by an example in terms of quartiles rather than percentiles, although the principle is naturally the same. Assume that we have two distributions of four items each, and that the savings ratios for the four items in each distribution, arrayed in order of increasing income, are exactly the same: $-20$; 0; $+20$; $+40$. The lines for the two distributions in the lower panel will then coincide, regardless what the dollar values are. Now assume that in the first distribution, the relative magnitudes of the four items are such that the second has an income twice that of the lowest; the third, an income twice that of the second; and the fourth, an income twice that of the third. The over-all savings percentage for the first distribution will be $+25.3$. Assume that in the second distribution the ratio between successive pairs of items in the array is 1.5 rather than 2. In that case, the over-all savings percentage will be $+19.7$. The two distributions have different group-savings ratios, yet their savings patterns in the lower panel coincide, point by point.

What is true of the pattern connecting percentages of money income saved with logarithms of differences between percentiles of income and 100 would be true were the $X$ scale in terms of the absolute distance of the percentiles from low to peak; or of logs or dollar amounts of money income. Indeed, the coincidence of savings pattern lines (or identity of their average level) means necessarily identity of the group-savings ratios only under one condition: that the $X$ scale assigns equal space to equal proportions of *total* income, received by sectors of the income population arranged in increasing order of income per unit. For example, if in Chart 1 the $X$ scale were in percentages of total income, with equal distances assigned to the

first 10 percent (i.e., received by the lowest income groups); the next 10 percent, and so on — then the coincidence of the lines, or identity of their average level (the latter average derived for the full range of the $X$ scale from 0 to 100), would necessarily mean identity of the over-all group ratios of savings to income.

In eager search for some function of savings to income that would be stable over time in terms of national aggregates and could thus serve as a basis for policy projections, there has been too ready an identification of savings patterns derived from one or several cross-sections of an income distribution, at a point of time, with a function relating changes of income over time with changes in savings. It is clear from the above that identity of savings patterns within each of several distributions does not mean identity of the savings-income ratios for the several groups compared. It follows that identity of savings patterns within one and the same distribution compared for several points of time does not mean identity of the over-all savings-income ratios for these several points of time; also that the savings-income ratios for the more comprehensive national totals are likely to be fully affected, in their changes over time, not only by the shift in the weights of the component distributions, distinguishable by their group savings-income ratios, but also by possible changes in the group savings-income ratio within each component distribution.

## 3 Conclusions Suggested by the Charts

The following conclusions appear to be suggested by the charts:

As we shift the savings pattern from the relation to logarithms of dollar income to the relation to logarithms of the distance of the percentile from the peak (i.e., 100), there seems to be some convergence in the average level of the lines. In other words, percentages of income saved in the several distributions tend to be more alike at the same percentile points, regardless of differences in the dollar values of the percentiles. This seems to hold for all the charts, but is least prominent for the comparison of farm families in 1935–36 and 1941 (Chart 5).

The significance of this finding has already been indicated by the authors. When the average dollar level of income is low, there is a lower dollar level of expenditures in both the lower

and the higher income brackets; consequently, the units in the higher brackets still save a sizable proportion of their income, even though their incomes are not necessarily at a high dollar level. When the average level of income is high, there is a higher dollar level of expenditures throughout the distribution, in both the lower and upper income brackets; consequently, the units in the lower bracket do not save much, if any, of their income, even though their incomes may be at a fairly high dollar level. We cannot tell whether it is the higher (lower) average level of income that is the cause of the higher (lower) level of expenditures throughout the distribution; whether the causal connection is the other way around; or whether, as it is most realistic to assume in the case of social interrelations, the influences run both ways. Certainly, for rural and metropolitan communities there is a two-way interrelation between lower average levels of income and expenditure.

There are, however, significant exceptions to this convergence of the levels of the savings-income ratio due to the shift of the relation to logarithms of the percentile distance from the peak. First, in the highest percentiles, whose weight in total savings is greatest, such convergence of savings-income ratios is *not* observed. In Charts 1 and 2 the lower panels show marked differences in the levels of the various lines beyond the 95th percentile. It is quite possible that a similar divergence of levels could be observed in the extreme left ranges on the $X$ axis, i.e., at the very low percentile positions. There is some suggestion of it in the lower panels of Charts 3 and 5 (scatter of numbered points). But the coverage of the lower percentile positions is insufficient to test the suggestion.

The divergence of the line levels just noted may reflect the size of family factor or be due to errors of sampling. But unless that were clearly demonstrated, the divergence of the savings pattern levels at the extreme ranges on the $X$ axis in the lower panels means that the interrelation of dollar incomes and expenditures, which makes of each distribution, as it were, a closed economic universe, stops at the very low and at the very high income brackets, whose negative and positive contributions to the total savings pool may be quite heavy.

The three other exceptions — observed in Chart 4 (comparison of 1901 and 1918 with more recent distributions); in

Chart 6 (comparison of savings patterns for Negro and white families), and in Charts 1, 2, and 5 (farm and nonfarm) — are noted and discussed by the authors. They provide other limits for the generalization covering convergence of savings patterns based on the relation to the percentile position. If we add to them the qualification suggested above, and note that the comparison of 1935–36 with 1941 is of limited value because both years were in the rising phase of the business cycle, the generalization as to the convergence of *levels* of savings patterns becomes circumscribed to middle ranges of the income distribution, and to income populations not too much differentiated by time, pattern of life, and race.

Interesting conclusions are suggested by comparing the slopes of the savings pattern lines. The first is that the shift of the line from the relation to logarithms of dollar income to the relation to logarithms of the distance of the percentile position from the peak produces much less convergence of slopes than it does of the average levels. Indeed, in at least one case, the shift results in a greater divergence of slopes (see the New York line on Chart 2). We are at a loss how to interpret this observation.

More significance can be attributed to the differences in slope among the distributions compared in the successive charts. In Charts 1 and 2 the slopes for metropolises are distinctly lower than for smaller communities; and those for villages and small cities are highest of all. In Chart 4, the earlier samples, particularly that for 1901, are marked by much steeper slopes than the later — paralleling, in a sense, the result of the comparison of larger and smaller communities in 1935–36.

Thus, the charts tell us that in smaller communities differences in relative income position have more effect on the savings ratio than in larger communities. This may be due to either of two factors. First, the income differences may be steeper in smaller communities, in the sense that incomes above the 95th percentile (or 75th or any high percentile) are higher compared with incomes below that line than are the incomes above the high percentile level compared with the lower bracket in the large city distributions. Such greater inequality of distribution would lead to a steeper slope of the savings pattern. Second, the relative differences in dollar income at successive

percentile levels may not be greater in smaller communities than in larger; but the opportunities and incentives for raising expenditure levels steeply, in conformity with an increase in income, may be much fewer in smaller than in larger communities. Consequently, a rise in the relative income scale in smaller communities necessarily brings about a steeper rise in the ratio of savings to income. Nor is the other extreme, of low living expenditures, as likely in smaller communities as in larger cities — which would explain the difference in slope at the lower end of the distribution.

There is some suggestion that the slope of the savings pattern is steeper in the very low and very high regions of percentile levels. In Chart 1 this steeper slope can be observed for metropolises and large cities in the movement to the 50th percentile; and in most community sizes beyond the 95th percentile. This is also found in the lower panel of Chart 2; and interestingly enough, also for farm families in Chart 5. In Charts 1 and 2 steeper slopes at the left and right sections are observed also in the upper panels, although not as clearly as in the lower.

The explanation may lie in the effect of the transitory elements on family income status in any distribution based upon income for a single year alone. The presence in the lower brackets of families whose incomes happened to be unduly depressed during the given year would lead to a very low savings-income ratio — these families would not tend to cut consumption to the current year's income. As with a rise in the scale from the very low to the medium brackets the proportion of these temporarily depressed families diminishes, the savings-income ratio may rise rapidly. Likewise, in the very high brackets there may be families enjoying a temporary income advantage; and here also the savings-income ratio will be abnormal — abnormally high. Since the proportion of these transitorily elevated incomes increases as we pass into the very high brackets, the savings-income ratio may rise steeply.

ALICE C. HANSON

Mr. Vickrey's discussion shows considerable ingenuity, but contains some errors in both logic and fact. It also reveals lack of familiarity with the considerable body of thought and literature on the subject of consumption scales as a tool for mean-

ingful classification of families. If he had read carefully Robert Morse Woodbury's article in the *Journal of the American Statistical Association* for December 1944, or inspected critically the BLS 1934–36 'wage earner' family expenditure study or the various European and other studies that have used the consumption unit as a basis for classifying families he surely would not have made a large portion of his remarks.

As a technique for analysis adapted to certain problems, for certain times and places, a classification of families by income or expenditure per equivalent adult male is useful. Such a classification merges into one measure both income (or expenditure) and family size. That very merging, however, makes such a classification completely unsatisfactory when it is desirable to look at the two influences separately. As Dorothy Brady points out, families double and undouble as the general economic situation changes, and the distribution of consumer units by size is not independent of income. In comparing two periods, the combined classification makes it impossible to trace the effect upon expenditures of real changes in spending habits separately from changes in the size and composition of consumer units.

The primary argument for the unit consumption level or unit expenditure level classification of families hinges upon the assumption that welfare or roughly equivalent well being should be the basis for assigning families to the same group. There are many specific purposes for which income and expenditure data are used, however, especially in market analysis, where the problem is not one of welfare, but of tracing the dollars as they flow into the market from the family purse. The family purse is real and is an understandable concept, whereas the purse of a statistical 'unit' is anything but clear.

True, family size influences the disposition of the family dollar. One unambiguous method of tracing its effect is to present data on expenditures for each of several family types (husband and wife only; husband, wife, and one child; etc.) at each income level; e.g., as in the Consumer Purchases Study and for the main categories of family expenditures in the small wartime studies made by BLS and BHNHE. This presentation allows the investigator to develop his own definitions of equivalent welfare for each consumption category — food, clothing,

housing, etc. — from the data on actual family behavior, and to make such special analyses as he desires without the handicaps of specific welfare assumptions which may be irrelevant to or actually wrong for his purpose.

For the investigator who wishes to summate findings for several family type-income level groups, an easy conversion is possible, using any one of several consumption unit scales, which for most purposes could be quite rough and still give rather satisfactory results. With a minimum of clerical computation, the writer, in collaboration with Hans Staehle at the ILO (ILO Studies and Reports, Series B, 30), used such a conversion for an analysis of levels of food adequacy.

One of the greatest objections to the consumption unit analysis is that it is almost impossible to devise an all-purpose scale. A scale suitable for one purpose, say measurement of differing needs or requirements as determined by experts, will differ from a scale measuring varying actual participation in family consumption by members of differing age and sex. The former would serve an adequacy analysis, the latter a market analysis. Also a scale attempting to reflect actual participation should probably vary at different income levels. For some purposes a scale should be very precise with respect to differing food requirements or food consumption of persons of different age and sex but might be very crude with respect to all other categories of family expenditure. For another purpose as much precision as possible in all categories should be attained. A scale that is right for one purpose is bound to be wrong for certain others. Any scale, either of requirements or of actual consumption, must be related to some group of people at some time and place. Hence comparability between studies using such scales from country to country or from time to time becomes difficult.

It seems highly probable that for these reasons as well as others that could be adduced, a simple per capita measure, without refinement for age and sex, would serve reasonably well for many of the welfare purposes and would have the additional merit of being unambiguous and comparable for different times and places. If there is sufficient demand for consumption data classified on a welfare basis, the additional cost of presenting at least the major categories of expenditure

and savings for families classified by per capita income or per capita expenditure should not be insurmountable.

As for the question whether a more nearly true marginal propensity to save is revealed when families are classified by expenditure than by income, there is no need to rely on speculation on the grounds that data are wanting. They are readily available in the 1934–36 wage earner study. Mr. Vickrey's dismissal of the wage earner study on the grounds that it is a partial sample is not valid when the problem is one of internal classification and examination of relationships. The wage earner sample was as a matter of fact much better for such purposes than the much smaller sample of 1941 upon which his attention chanced to fall. Had the wage earner study included entrepreneurs and others with presumably more variable incomes, the contrasts noted in the two forms of classification would probably only have been accentuated.

The wage earner study reveals as clearly as any more inclusive sample could ever do that a unit expenditure classification tends to put large families at low expenditure levels. At the high expenditure levels are the small families composed of both young people with few or no children and older people drawing upon reserves; also families with unusual large expenses as for a car or refrigerator. A family type analysis would serve at least in part to differentiate these several groups, and for certain purposes there should be a further division by age of family head or of homemaker, since expenditure and savings patterns are certainly different for young and old couples.

The chapter on savings in the summary volume of the wage earner study (BLS *Bul. 638*) compares the effect upon the savings figures of two methods of classification, that by family income level and that by unit consumption level. Charts on pages 169 and 177 of that volume set forth clearly the sharp contrasts in the data resulting from these two methods. Net savings were prominent at high income levels but net deficits were characteristic at high consumption levels. For the 42 cities combined, for example, the percentage of families with net savings increased from 41 to 77 from the lowest to the highest *family income* group, whereas the percentage with net deficits increased from 32 to 74 from the lowest to the highest

*unit consumption* level.[1] The largest average surpluses were found at the lowest consumption levels, although average incomes were lower and average family size larger than at the high consumption levels. Conversely, the largest average deficits were found at the highest consumption levels. The accompanying text discusses some of the probable reasons, including the one that people's spending is determined not only by current income but also by savings and ability and willingness to borrow.

This method of classification removes the difficulty of interpreting the large deficits incurred by low income families relying on savings. But it complicates the savings pattern at low consumption levels by combining the high savings of small families, especially the older ones having fairly high incomes, with the deficits or small savings of families with small children and moderate or low incomes. The assumption that the same low income families cannot run deficits year after year might, incidentally, bear some careful checking. Mortalities in independent grocery businesses, percentage of doctors' bills never collected, high prices charged by company stores, etc. may all be factors that help to carry low income families who are chronically in debt.

Since saving equals income minus expenditure, at any specified income level, high spending inevitably means low saving out of current income. In a year of changed incomes, if expenditures stay relatively stable, savings must vary from those of the preceding year. It is difficult to see, therefore, that a savings-expenditure relation will be any more 'true' than a savings-income relation. An unstable savings figure related to a stable expenditure figure will undoubtedly give a different answer than an unstable savings figure related to an unstable income figure. In either case, however, the element of instability is still there in the vital figure, namely, savings.

With respect to the 1934–36 wage earner study, Mr. Vickrey states incorrectly that the scales of relative consumption needs for food and for clothing (used to determine the number of equivalent adults) were set up on the basis of standard budgets. The clothing scale was set up on the basis of clothing expendi-

[1] BLS *Bulletin 638*, pp. 170 and 174.

tures of persons of differing age, sex, and occupation as actually found in the study. The food scale was set up on the basis of nutritional requirements tempered by known data on actual food consumption in families of wage earners and clerical workers. This information is clearly set forth in the appendix of every one of the detailed wage earner study volumes (BLS *Bul. 636*, *637*, and *639–41*). There is particular emphasis in the summary volume (*Bul. 638*) that the scales do not represent ideal or normal budgets but are based upon customary behavior in families where the addition of a child is not as a rule accompanied by any addition to income and the family must adjust its expenditures to meet the new situation.

Mr. Vickrey suggests that failure to use the unit expenditure method in subsequent studies was due to the complexity of the classification procedure; that wider acceptance would have been gained had the classification method been simpler and the average family incomes and average family sizes of the families classified in a given unit expenditure class been emphasized.

The writer agrees that, for many special purposes where the use of scales is desirable, scales more simply arrived at and more readily explainable would be preferable. The degree of refinement warranted varies widely with the problem at hand. Yet, despite his plea for simplicity, Mr. Vickrey proceeds to urge more, not less, complexity in preferring varying factors for the scales for housing and miscellaneous categories rather than the assumption followed in the wage earner study, namely, that participation of all family members in expenditures for goods and services other than food and clothing (i.e., house, car, radio, newspaper, etc.) is roughly equal.

The problem of the complexity of the particular scale used, however, has little to do with the conceptual difficulties of interpreting the results. If one substituted 'per capita' for 'per unit' in the wage earner tables, one would still be troubled by small average sized families composed mainly of adults at high 'per capita' expenditure levels and large average sized families at low expenditure levels. He would still wrestle with the problem of trying to relate an income level to a 'per capita' expenditure level, since average incomes rise at higher expenditure levels. He would still find an association between high spending and low saving.

The suggestion that more prominence might have been given to figures on average income and average family size at each unit expenditure level in the wage earner reports is good. Nevertheless, mere convenient location of the figures would not eliminate the problems in interpretation to which they give rise.

MARGARET G. REID

Mr. Vickrey contends that the usefulness of family income, expenditure, and saving data as indicators of welfare and the propensity to consume is increased by classifying families by expenditures per equivalent adult. No one will deny the need for further exploration of ways of making these data yield additional information nor the earnestness and vigor with which Mr. Vickrey presents his hypothesis and findings. With respect to his own proposals, however, there is nowhere apparent the critical ability he displays in discussing the use of classifications by family income, which are generally recognized as being far from perfect for many of the uses to which they are put.

Classifying families by any measure using per adult equivalent rather than families undifferentiated for size and composition raises quite different issues than classifying by expenditures rather than income. Nevertheless, he does not show the bearing of each of these on propensity to consume. The need for measuring the size of families in terms of equivalent adults exists chiefly, if not solely, when the sample of families is too small to permit their classification by type; whereas the matter of classifying by expenditures rather than income exists no matter what the size of the sample.

The search for a measure of the relative need of families of various size and composition has a long history. Mr. Vickrey touches on this fact briefly. He recognizes that difficulties exist in developing a logical measure, but feels that a simple arbitrary measure is better than none. Some readers may wish to take issue with Mr. Vickrey on the relative values of his scale for various persons; for example, the relatively low scale for unemployed persons 16 to 20. These are likely to be in school and to have needs that are at least no less than those of the same age who are employed. But even more important seems

to be a shortcoming that Mr. Vickrey's scale has in common with many others that have been set up, namely, no allowance is made for the economies of group living. Classification of families whether by per capita or per adult equivalent income or expenditure causes a marked clustering of large families at low income or expenditure and a marked clustering of small families at high income or expenditure levels.

Mr. Vickrey's discussion is lacking in perspective because he fails to discuss the findings of previous investigators bearing on the use of per adult equivalent scales and furthermore to note that the design of the Consumer Purchases Study to permit the classification of families into types taking into account both size and composition was due to the recognized limitations of such measures.

Classification of data by expenditures rather than income was used in many early studies largely because of failure to obtain income data. In many such studies the classification was by family expenditure, not by expenditure per equivalent adult. The most notable analysis using a classification by expenditure per equivalent adult is that of the wage earner study of 1934–36. Mr. Vickrey comments briefly on and expresses general approval of this "one notable attempt to classify families by economic welfare levels". Although he feels that the method used for measuring family size was unnecessarily complex, he speaks of the findings from this study as being "fundamentally more meaningful" than they would have been if the data had been classified by family income. One cannot but wonder whether Mr. Vickrey examined the consumption data in any of the several volumes of this study. Did he realize, for example, that the higher the expenditure per adult equivalent the lower the average savings and the higher the percentage of families having a deficit? For Columbus, for example, from the lowest to the highest expenditure group, average savings dropped from \$88 to \$13; and the percentage of families having a net deficit, rose from 23 to 38 percent.[1] These figures should cause one to question whether such a classification gives valid results for measuring the marginal propensity to consume or the distribution of families by level of welfare.

[1] Bureau of Labor Statistics, *Bul. 636*, 1940, p. 344.

In the light of these data and data in Mr. Vickrey's paper, it seems worth while here to note a point with respect to the marginal propensity to consume. Mr. Vickrey emphasized that his lowest expenditure group had a net saving. He did not speculate on the fact that this was in part conditioned by the very classification he used. Limiting his lowest group to families with expenditures of less than $200 automatically excludes all those with a deficit exceeding $200. The higher the expenditure the greater the possibility that families will have large deficits.

Mr. Vickrey does not provide facts from the 1941 data he uses on the percentage of families having surpluses and deficits at the various expenditure levels.[2] His analysis is mainly in terms of dollar savings. For nonfarm families in 1941, he found no expenditure groups with a net deficit. Except for the three highest expenditure groups, the percentage that net surplus is of income does not change consecutively with increase in expenditure. Data derived from Mr. Vickrey's tables are given in the accompanying tabulation.

| EXPENDITURE PER EQUIVALENT ADULT GROUPS | % SURPLUS IS OF INCOME | EXPENDITURE PER EQUIVALENT ADULT GROUPS | % SURPLUS IS OF INCOME |
|---|---|---|---|
| $0–200 | 2.6 | $900–1,000 | 4.1 |
| 200–300 | 5.0 | 1,000–1,200 | 2.4 |
| 300–400 | 4.0 | 1,200–1,500 | 7.5 |
| 400–500 | 5.4 | 1,500–2,000 | 10.2 |
| 500–600 | 4.6 | 2,000–3,000 | 9.3 |
| 600–700 | 6.9 | 3,000–5,000 | 11.3 |
| 700–800 | 5.6 | 5,000 & over | 30.1 |
| 800–900 | 4.4 | | |

Findings of the wage earner and the 1941 data are not compared in Mr. Vickrey's paper. Two differences between the two surveys seem especially important.

The wage earner data are presented by separate cities whereas the 1941 data are for all nonfarm groups in the country as a whole; and the 'nonfarm' group in the 1941 study includes among others families living in the open country who are not farm operators.

The families in the wage earner study were confined to wage earners who had reasonably full employment and to lower salaried clerical workers; hence, the income distribution differs from that of all families, whereas the 1941 sample was designed

[2] Mr. Vickrey supplied the data after his paper had been circulated (Editor).

to provide a cross-section of all incomes. Had Mr. Vickrey had the findings of the analysis of the wage earner data in mind when he planned his analysis, he might have contributed some explanation of why the findings of the two studies, with respect to savings, are different.

Speculations are in order concerning the effect of the difference in samples of these two sets of data on the percentages of income saved by groups of families classified by expenditures per equivalent adult. What might be expected from the 1941 data because of the inclusion of the whole gamut of incomes? If the inclusion of high incomes were the only difference between the two sets of data, one might expect to find, as expenditures rose, a decline and then a rise in average savings, as relatively high expenditure levels are reached. The 1934–36 wage earner data excluded also many low income families. Because of the limitation on deficit imposed by the classification, any average deficit, should it appear at low expenditure levels, would not be large.

Mr. Vickrey's data do not show consistent changes in savings with expenditures per adult equivalent. The blending of the regions and the urban and rural nonfarm groups may account for the failure of a clearcut pattern to emerge. The national nonfarm sample as a whole is a combination of a series of family types, regions, and communities varying in degrees of urbanization. Groups with U-shaped regression lines may overlap so as to give data such as are shown in Table 1.

Some tabulations with families classified by expenditures have been made of the 1941 rural nonfarm families (Table 1). The data for 5 family types classified by expenditure suggest that savings in relation to income have a U-shaped regression. In addition, the cross-tabulations of income and expenditures of families of various types in villages and small cities in 1935–36 in the Consumer Purchases Study suggest that the combination of various groups tends to blur the picture.[3]

In searching for a measure of the family's general level of welfare, Mr. Vickrey rejects annual income, largely because of its tendency to fluctuate from year to year. No one will question the fact that for many families such fluctuations do

[3] See for example, Department of Agriculture, *Misc. Publication 396*, pp. 358–63.

TABLE 1

Number of Families and the Percentage that Surplus or Deficit is of Income plus Gifts and Inheritances, Rural Nonfarm Families

| Expenditure per family groups | NUMBER OF PERSONS IN FAMILY: 2, Head 60 years or older | 2, Head under 60 years | 3 | 4 | 5 or 6 |
|---|---|---|---|---|---|
| | NUMBER OF FAMILIES | | | | |
| $0– 499 | 61 | 24 | 37 | 18 | 15 |
| 500– 999 | 37 | 32 | 37 | 36 | 38 |
| 1,000–1,499 | 25 | 43 | 57 | 39 | 46 |
| 1,500–1,999 | 10 | 26 | 42 | 25 | 30 |
| 2,000 & over | 7 | 17 | 30 | 31 | 39 |
| | % THAT SURPLUS OR DEFICIT IS OF INCOME PLUS GIFTS AND INHERITANCES | | | | |
| $0– 499 | 4.8 | 9.6 | 3.6 | –1.6 | –0.5 |
| 500– 999 | 3.9 | 8.8 | 0.9 | 11.3 | 4.9 |
| 1,000–1,499 | –3.2 | 3.5 | 7.4 | 9.5 | 2.6 |
| 1,500–1,999 | –5.1 | 12.1 | 9.7 | 13.0 | 1.8 |
| 2,000 & over | 13.0 | 35.2 | 11.8 | 4.9 | 8.0 |

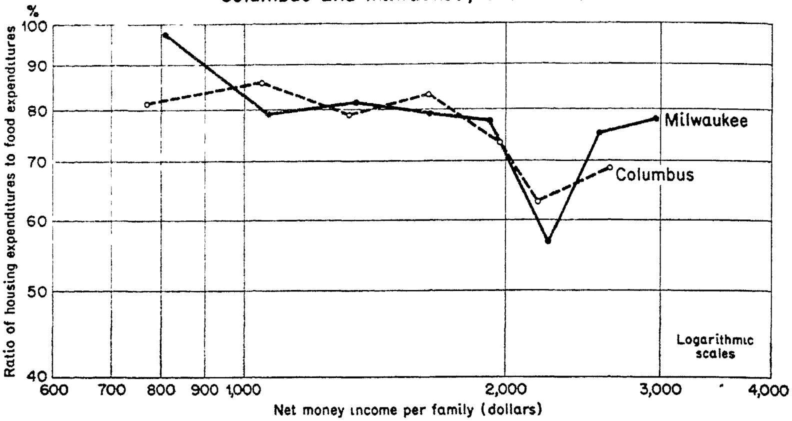
occur. He says that he would have been willing to accept average income for a period of years but could not do so since such data do not exist. However, an average for a period of years may be needed for expenditures as well. A family may, for example, fall in a very high expenditure group in any one year because of high medical expense or because furniture or durable types of clothing were bought. Conversely, expenditures in a given year may be low because funds are being set aside for later purchases of such items. Such irregular spending makes annual expenditures a very uncertain measure of a family's general level of living.

In addition, regular spending may not be a suitable measure of the relative welfare level among families. It would, for example, tend to throw into the low expenditure group families living in their own homes. Payments on the house would appear under savings. In such a situation low expenditure would tend to be associated with high savings.

Certain data for the wage earner study of 1934–36 are given with families classified by both 'economic level' (annual expenditure per unit), and family income regardless of the size and composition of families. A striking difference is shown in the ratio of food to housing with a rise in economic level in contrast to an increase in family income. In Chart 1 are shown data for Milwaukee and Columbus with families classified by

CHART 1

Ratio of Housing Expenditures (incl. Fuel, Light, and Refrigeration) to Food Expenditures, Wage Earner Families Classified by Family Income Columbus and Milwaukee, 1934–1936

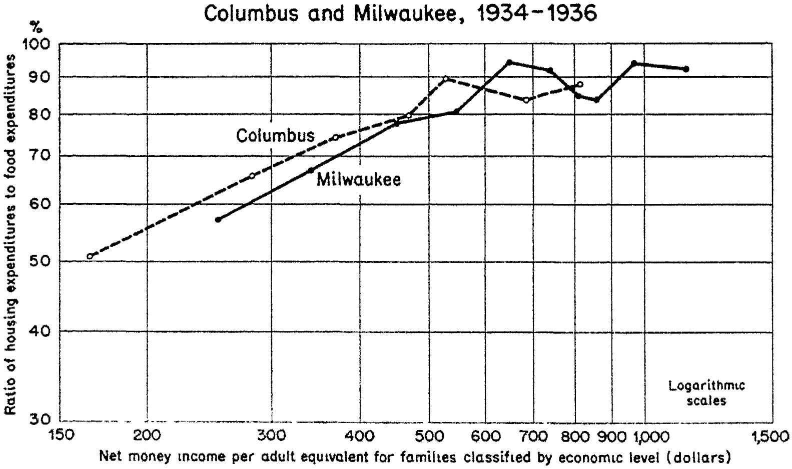



Source: Bureau of Labor Statistics, *Bulletin 636*, 1940, pp 165, 177, 181, and 187.

net money income; and in Chart 2 are the same families classified by economic level. In Chart 1 the ratio shows a tendency to decline, whereas in Chart 2 it shows a marked tendency to increase. Differences in the distribution of home ownership and family size are undoubtedly factors causing the slope of these regressions to differ.

CHART 2

Ratio of Housing Expenditures (incl. Fuel, Light, and Refrigeration) to Food Expenditures, Wage Earner Families Classified by Economic Level Columbus and Milwaukee, 1934–1936




Source: Bureau of Labor Statistics, *Bulletin 636*, 1940, pp. 119, 131, 135, and 141.

The data in Charts 1 and 2 and in Table 1 though preliminary provide an adequate basis, however, for concluding that much further investigation is needed of the classifications proposed by Mr. Vickrey.

Perhaps as further analytical work is done, it will be possible to derive something from classifications of families by all or part of their expenditure that will indicate levels of welfare. It also seems probable that measures of equivalent adults may be developed that are really useful. These will need to be tested against data where families are classified by type of family and community.

DOROTHY S. BRADY

Implicit in Mr. Vickrey's discussion is an assumption that should be examined because it is fundamental to much of the present thinking in this field. His entire argument takes for granted that a single measure, such as the distribution of all consumer units by economic level, can serve the multitude of purposes for which such data are used. If this assumption is accepted, then composites that summarize variation with respect to two or more factors must be constructed and the formula used is of considerable importance. If the assumption is not regarded as necessary, attempts to construct and interpret combinations of the variables into one index may be considered interesting and valuable as experiments without serious consequences.

If there is no alternative to the merging of family size and income into one measure, the main lines of Mr. Vickrey's argument cannot be disputed. There is, however, a simple and direct alternative — to tabulate data on income distribution and expenditures by income level and family size. Such tabulations, by and large, allow the analyst to develop and use his own definition of equivalent level of welfare adapted to the purposes of his analysis. In the design of the Consumer Purchases Study, family type was maintained as one of the fundamental controls. The voluminous reports for survey areas published by the Bureau of Labor Statistics and the Bureau of Human Nutrition and Home Economics as well as the National Resources Planning Board present such tabulations by family type in considerable detail. Although the samples for the

1941 survey and the 1944 urban study are small, the income distribution and the main summary of expenditures for family size groups have been published. With the analysis of the data on family size from the Consumer Purchases Study as a background, the usefulness of these data from small samples can be maximized.

The direct tabulation of consumption data by the two variables, income and family size, not only allows for varying the definition of equivalent economic status according to the purpose of a given analysis, but also provides the objective bases for developing the definitions of equivalence. Such tabulations as the grade of diet by family type and income group and the characteristics of housing by family size and income group, both included in the reports of the Consumer Purchases Study, give the analyst a basis in fact for approaching objectively the determination of scales defining equal welfare for families of different sizes.

For many problems the investigator is not necessarily concerned with measures of equivalent welfare. To study, for example, the probable effects of alterations in the level and distribution of income on the demand for housing in a given community, the distribution of consumer units by income and family size together with the total number of families of each size provides a much better foundation for analysis than any composites of the two variables. The distribution of consumer units by size of family is not independent of the income situation. Although verification in statistical fact is in many respects insufficient, it is safe to assume that in periods of low incomes the consumer unit is larger than in periods of relatively high incomes. The importance of the changes in the number and size of consumer units with the income situation has been recognized by students of housing to the extent that the 1940 Census carried through extensive tabulations of 'subfamilies', units that, given a more favorable economic situation, might form separate consumer units. The propensity for the number of consumer units to increase with improvement in the general income situation should be considered in connection with many other problems of interpretation and estimation much more seriously than it is at present.

Likewise, consumption patterns for many purposes are better

summarized as a two variable relation than through any scheme of combining income and family size into one measure. The potential usefulness of a multivariate analysis was noted in Allen and Bowley, *Variations in Family Expenditures*, and has been stressed on numerous occasions by Milton Friedman and others. It is easy to see in the example of housing demand that estimates based upon the probable number, size, and income of consumer units and the housing consumption of families of each size and income bracket would have more validity than estimates based upon consumption per capita. Any combination of the size of family with income would obscure the differences between two periods where there had been significant changes in income and correspondingly in the size of the consumer unit. Direct tabulation of expenditure data by income and family size would reveal whether expenditures on some item remained the same for the two periods among families of the same size at the same income level, or had changed in some manner. Tabulation by a measure that combines income and family size would reflect the effects of changes in both the consumption pattern and the size of the consumer units. The effect of the changes in the 'weights' could not be isolated.

The argument for expenditures as a measure of income was focused on the problem of fluctuations in income. The fluctuations in expenditures and, perhaps more important, the systematic relation between expenditures and age, income held constant, were not sufficiently considered. Family experience is such that even with constant income for a period, expenditures will vary considerably from year to year. The year a baby is born or an operation is performed, a new car or new household equipment is purchased the family may run a deficit. It is apparent from the data tabulated from the Study of Money Disbursements of Wage Earners and Lower Salaried Workers that the classification by expenditures effectively placed in the higher economic brackets two groups of families, small families and those that, in the year, had an 'unusual' expenditure.

Savings fluctuate with expenditures. The association between them may be described as the net effect of the direct correlation with income and the inverse correlation between savings and expenditures for the same income. If certain types

of fluctuation in annual income render it a poor measure of economic level, the annual savings associated with annual income are a poor measure of savings. In the correlation of expenditures and savings of a given year, the 'unusual' situations are concentrated at the lower and upper ends of the expenditure scale.

The negative correlation between expenditures and savings at given levels of expenditure per equivalent adult is so amply illustrated in the reports of the Study of Money Disbursements of Wage Earners and Lower Salaried Clerical Workers that it is unnecessary to resort to speculation on the ground that data are wanting. Careful study of the tables in these volumes leads to the conclusion that the effect of short run fluctuations is not minimized by using expenditures as the classification base.

Expenditures of families change consistently during the life cycle. When all the changes in family experience are considered, the argument that family expenditures in a given year provide a measure of 'average' income is not so clear. To be sure, classification by expenditures avoids problems of interpreting the deficits in the low income groups so far as they are due to the spending of retired persons drawing on savings or of families suffering a temporary loss of income. But another problem of interpretation is substituted: the savings of low 'income' groups due to the inclusion in the lowest brackets of such groups as older couples with a fairly high income, as usually defined. The expenditures of small families, particularly those in older age groups, having fairly high incomes cannot be considered a measure of 'average' income. The effect of the classification by expenditures is accordingly a distortion of the relations sought. The groups for which it is entirely unreasonable to assume that expenditures and average income are identical at any time will be concentrated at both the lower and upper ends of the scale.

The problems of measuring and interpreting income can probably never be solved by such a simple expedient. A much more difficult route must be followed. Data must be collected and analyzed separately for groups likely to differ in income experience and family needs, families at different points in the age cycle; wage and salary families, entrepreneurial and retired

families; families in the different economic zones of the country. The deficits of the lower income brackets do not disappear as a problem through statistical legerdemain. What is needed, and this is mere repetition of the recommendation of the National Resources Committee in *Consumer Expenditures in the United States*, is careful study of these groups. A classification of the low income groups by size of family, age, source of income, and locality provides the analyst with the basis for interpreting the meaning of the deficits of these groups. The families in the low income brackets that go into debt to cover living expenses are not attempting to maintain a high standard of living; they are simply trying to exist. They are not drawing on savings, for they have no savings. Only a few have long run prospects for higher incomes. Such families are still a significant proportion of the 'low income groups', even of the total population. Their expenditures measure level of welfare only in a narrow and callous sense. Security is one important element in human welfare. The presence of an accumulation of debts among families of low incomes is perhaps a more significant index of their unfortunate situation than bad diets and poor housing. Any statistical device that would hide the plight of such groups would ultimately be unfortunate from the viewpoint of the investigator interested in measuring welfare and in understanding how people actually live.

JEROME CORNFIELD

Mr. Vickrey's paper is useful in concentrating attention upon the problems involved in using family budget studies as a basis for estimating certain economic parameters, particularly the marginal propensity to consume. The author's unfamiliarity with previous work on these problems, however, has, I believe, led to the adoption of unsuitable methods and the derivation of incorrect results.

Most early attempts to eliminate the effect of family size on expenditure by use of a single omnibus variable had their formal justification in the following type of argument: (a) expenditure is a joint function of family size and income; (b) since family size and income are correlated, a classification of families by income alone attributes to income an effect on expenditure that

is partly ascribable to family size; (c) a special measure of family size, $S$, may exist such that we can write $E = SF(S, I)$, where $E$ is expenditure, $I$ is income, and $F$ is a homogeneous function of degree zero; (d) in that case, $\frac{E}{S} = F(1, I/S)$, and since $\frac{d\,(E/S)}{d\,(I/S)} = \frac{dE}{dI}$, when $F$ is a function of this type, classifying families by $I/S$ will give the same information on the net effect of income as a simultaneous classification by income and size.

As data accumulated, it became apparent, however, that the assumption of a homogeneous function of degree zero was incorrect and that the effect of family size could be eliminated only by a simultaneous classification by both income and family size. R. G. D. Allen's analysis of the results of the Consumer Purchases Study, which Mr. Vickrey has apparently overlooked, is one example of this type of analysis.[1]

Even though no work of this type had been done, Mr. Vickrey's own cross-tabulation would supply ample evidence of the inadequacy of this formulation. Were the formulation correct, expenditure per equivalent adult should be a function only of income per equivalent adult and should be unaffected by variations in the number of equivalent adults. The accompanying tabulation, computed from the data in his Tables 3 and 4, shows the relationship between the two variables for two size groups. Expenditure per equivalent adult is con-

| AVERAGE INCOME PER EQUIVALENT ADULT | AV. EXPENDITURE PER EQUIVALENT ADULT, FAMILIES WITH: | |
|---|---|---|
| | 1.1–2.0 EQUIVALENT ADULTS | 4.1–5.0 EQUIVALENT ADULTS |
| $200 | $250 | $214 |
| 300 | 334 | 296 |
| 400 | 448 | 403 |
| 500 | 556 | 507 |
| 600 | 618 | 598 |
| 700 | 704 | 684 |
| 800 | 790 | 770 |
| 900 | 866 | 842 |
| 1,000 | 953 | 902 |

[1] 'Expenditure Patterns of Families of Different Types' in *Studies in Mathematical Economics and Econometrics* in Memory of Henry Schultz (University of Chicago Press, 1942).

sistently lower for the larger size group at each level of income per equivalent adult. Clearly, the effects of differences in family size have not been held constant by the procedure used.

Though based upon a false assumption, the procedures employed by Mr. Vickrey when he classifies families by income per equivalent adult have at least the virtue of logical consistency. But when he classifies families by expenditure per equivalent adult and applies the same procedures, even this virtue disappears. It is possible to argue without logical inconsistency that even after eliminating the effect of family size, expenditure is a function of past income as well as of current income. It may also be possible to classify families by some index of past income and estimate the effects of past income on expenditure by computing the ratio of the change in expenditure to the change in the index of past income. If one uses expenditure as an index of past income, this procedure will of course yield a 'long term marginal propensity' of unity, which suggests that the index may be of limited value. It is impossible to preserve any measure of logical consistency, however, if one classifies families by an index of past income, then computes the ratio of the change in expenditure to the change in current income. If current income is inappropriate for classification, it is inappropriate for division as well.

Mr. Vickrey can verify the relevance of these remarks by conducting an experiment for a group of families with the same number of equivalent adults. If his procedures work when families differ in size, they should work when family size is constant. If he classifies such a group of families by expenditure, then estimates the 'long term marginal propensity' by computing the ratio of change in expenditure to change in current income he will be surprised to discover, I think, that his marginal propensity exceeds unity.

Mr. Vickrey's preference for expenditure as a basis of classification is based upon the following argument: (a) family budget data are inadequate for measuring the short term effects of changes in income on expenditure, because of the period of adjustment required; (b) because the low income groups contain temporarily depressed and the high income groups temporarily elevated families, income is an unsatisfactory variable for estimating the long term effect as well. The second

objection is relevant only if the first is valid. If family budget studies can provide estimates of the short run marginal propensity, it is desirable to have the estimates reflect the effects of temporarily elevated and temporarily depressed families.

What then are Mr. Vickrey's grounds for believing that family budget data cannot provide an estimate of short run propensities? Mr. Vickrey believes that a long period, "probably five years or more", would be required for a family to adjust its expenditures to a higher or lower standard of living. In other words, any attempt to use the family budget data of one year to estimate expenditures in another year will underestimate expenditure in years of lower income and overestimate it in years of higher income. This second formulation has the virtue of being verifiable. Such a verification has been attempted and the results do not support Mr. Vickrey's thesis.[2] The income-expenditure relation shown by either the 1935–36 studies or the 1941 study seems to explain the variation in consumer expenditures during 1929–41 with a maximum error of 3 percent. Apparently the crude and unsophisticated wants of the poor can be transformed rapidly. They drink as much milk, visit as many doctors, and buy as much clothing as their more fortunate neighbors within a surprisingly short period of receiving higher incomes.

Further work attempting to explain the separate effects of present and of past income on current expenditure is clearly desirable. It will permit us to eliminate the effects of a particular pattern of increasing or decreasing income, imposed by the conditions prevailing at the time of an expenditure study, from our estimates of income-expenditure relationships. It will not, I believe, result in the radical changes in this relationship that Mr. Vickrey's use of expenditure as an independent variable would imply.

## *REPLY*

### Mr. Vickrey

While I must plead guilty to having criticized current procedures without having adequately investigated the literature and experience with the methods, there is no denying the need

[2] See *Full Employment Patterns, 1950* (Bureau of Labor Statistics, May 1946), Ch. VII.

for better classifications. Practical difficulties or the impossibility of obtaining a basis suitable for all purposes is no excuse for not at least attempting to meet it.

The art of statistics consists in summarizing a great deal of information in a few figures. To present the user of statistics with a series of distributions for different types of families and let him combine them as he sees fit is to leave an important part of the job undone, for it is certain that if a comprehensive distribution is not given, the reader will concoct one for himself, often with very little regard for underlying consistency. If the figures are presented by uniform family income groups, he will almost always follow the line of least resistance and combine them into a classification entirely by family income, rather than go through the elaborate statistical manipulation required to interpolate the various distributions to sets of income levels that would correspond to a reasonable index of family size. Indeed, most such interpolations are extremely approximate, and even if made by elaborate methods, entail some loss of information that could be avoided were the original tabulations by properly proportioned group intervals. By all means, let divisions by type of family be preserved, but if possible the income class intervals should be so chosen as to facilitate combination of the figures for the various family types on a more reasonable basis than family income. For be assured that if the compiler of the statistics does not combine the figures, or at least facilitate their combination on some reasonable basis, the amateur will not hesitate to do so on whatever basis is easiest, reasonable or not.

It is, to be sure, rather disappointing to observe that the reclassification on the particular 'per capita' basis adopted — admittedly more or less arbitrary — fails to bring about as great a degree of uniformity and consistency in the results as had been hoped. Mr. Cornfield's observation that at a given level of income per equivalent adult large families spend a smaller fraction of their income than small families indeed shows that for this scale of family size at least it cannot be assumed that the consumption patterns of large families are merely multiples of the patterns of small families. I freely confess that some such assumption was in my mind when I began the tabulation.

But the falseness of this assumption does not invalidate the per capita classification as a means of obtaining a closer approximation to a measure of what the man in the street thinks of as the distribution of income or its inequality. Moreover, it does not even indicate that the over-all figures classified by income per equivalent adult are necessarily more biased than those classified by income per family: if the question is what the aggregate spending pattern will be if all incomes are increased by a given percentage, for example, a classification in which each group contained proportionate numbers of families of different sizes would give correct results. Only when the proportions of different sized families vary between groups is a bias introduced.

Now the lower family income groups have substantially smaller proportions of large families than the upper income groups, as would be expected: consequently, the income per family distribution definitely has a bias of this sort. Unfortunately, it turns out that the reverse appears to be true, in only slightly less degree, of the classification by income per equivalent adult on the scale selected here: the lower income groups contain bigger proportions of large families. Thus the equivalent adult classification basis has the reverse bias to an almost equal degree.

The consequent bias of the family income classification is bad enough when an estimate is based on the assumption that an increase in incomes will leave family composition unchanged. Actually it seems likely *a priori* that increases in income will lead to establishing new family units, and hence to more and smaller family units. Thus if all the effects of a general increase in incomes are to be allowed for, there should also be allowance for fewer large and more small families. Actually an estimate on a per capita basis will make some adjustment in this direction more or less automatically: increasing the incomes will bring into play spending patterns representing more small families; the family income basis, on the other hand, produces an aggregate expenditure pattern implicitly representing more large families.

Possibly a classification with a smaller weighting for children and supplementary earners would produce a more even distribution of families of various sizes by income per equivalent

adult group, but it would be hard to justify setting up a schedule of weights for family members, or for that matter any coefficient representing family size, merely on the assumption that it would produce such a proportional distribution of families of different sizes.

It would be interesting to use Hans Staehle's technique of minimum difference in consumption patterns to determine the incomes at which families of different compositions are to be considered on the same level of welfare. But there is no guarantee that such a method would yield results that would be within the range of general welfare notions upon which the present scheme was built; much less that the ratios would remain the same at all income levels. And the results might well vary substantially according to the particular items of consumption used.

The fact that the hoped for uniformity is not realized by putting the classification on a per capita basis is no reason for preferring the family basis, but rather leads to new questions to be answered by further investigations. It is indeed one of the advantages of a per capita basis that it brings these additional problems into sharper focus. Why should large families spend less, on a per capita basis, than small? If the family basis is used, the bigger expenditures of large families are dismissed as due to larger needs and no further investigation is prompted. But when the classification is on a per capita basis, the lower expenditures of larger families become a challenge. Is the relation due to overstating the relative needs of dependents? Does it reflect economies of scale enjoyed by larger families? Does it in part reflect a concentration in small families of newly married couples having large outlays for consumer durables, and of older persons who have retired and whose children have left home, and a concentration in larger families of persons at the height of their earning power? Answers to these questions have important implications for both policy and the use of the statistics.

As to the question of income versus expenditure as a basis, data available at present are perhaps inadequate to permit a definitive and objective answer as to which provides a closer approach to the ideal classification. The peculiarities observed in the 1934–36 wage earner study do not, in my opinion, in

the least weaken the case for the use of expenditure. The striking difference between the regression of savings on expenditure found in the 1934–36 study and that found in 1941 is hardly reason for rejecting expenditure; rather it shows how this basis of classification brings into sharper relief differences between different periods and different sectors of the population. Incidentally, the rather peculiar nature of the 1934–36 sample is further illustrated by the fact that the indicated marginal propensity to save, even computed on an income classification basis, declines for the $1,800–3,000 interval. Moreover, the quartile incomes are about $1,150 and $1,820, a ratio of 1.58, while the quartile unit expenditures are about $350 and $630, a ratio of 1.8; ordinarily one would expect the relative dispersion of income to be greater than that of expenditure (BLS *Bulletin 638*, pp. 22, 56, 174). The corresponding interquartile ratios for 1941 are 2.92 for the distribution by family income level, 1.65 when this distribution is adjusted by allowing for single persons as 0.4 of a family, 3.05 when using income per equivalent adult, and 2.44 when using expenditure per equivalent adult, a somewhat more normal relationship. In effect, both the method of selection and the nature of the results of the 1934–36 sample indicate a systematic exclusion of incomes outside a given band, and particularly of families with incomes outside a given per capita income range; within such a slice of the distribution, savings are almost inevitably negatively correlated with per capita expenditure, regardless what a more representative sample might show.

Classifying families by expenditures does not mean that expenditure is taken as a measure of past average incomes, but merely that the rank of each family by current expenditure is considered the same as its rank by average past income. I cannot see how this procedure necessarily tends to produce a long term marginal propensity to consume of unity, as Cornfield suggests, unless this is taken to mean merely that all income is eventually spent in one way or another; in which case gifts and bequests would have to be included in expenditure. The actual figures are substantially and significantly less than unity.

Even if current expenditure were perfectly correlated with an average of past income, the implication would not be that the line of regression has a slope of unity in absolute terms.

Moreover, if current income is considered equal to past average income plus or minus a random variation, and this random variation is uncorrelated with variations in expenditures, then an average of current incomes in a current expenditure group will equal the average past income, but an average of current incomes in a current income group will differ from the average past income. This is the reason for using the expenditure group. The procedure is not to use expenditure as an index of past income, but to use the average current income in an expenditure group as the index of the hypothetical past income. I see no logical inconsistency in this.

As some interest has been shown in dividing families between those with deficits and those with surpluses, a division of the main diagonal of Tables 1 and 2 is appended. The

SUPPLEMENT TO TABLES 1 AND 2

Schedules in Main Diagonal with Expenditures Greater than Income

| PER CAPITA INCOME AND EXPENDITURE GROUP | NUMBER OF SCHEDULES | NUMBER OF EQUIVALENT ADULTS | TOTAL INCOME | TOTAL EXPENDITURE |
|---|---|---|---|---|
| $0– 200 | 92 | 269.1 | $ 34,132 | $ 38,814 |
| 200– 300 | 64 | 186.3 | 44,976 | 48,068 |
| 300– 400 | 54 | 161.3 | 51,301 | 54,476 |
| 400– 500 | 63 | 157.0 | 69,594 | 72,733 |
| 500– 600 | 64 | 166.6 | 90,478 | 93,754 |
| 600– 700 | 57 | 135.6 | 85,053 | 88,810 |
| 700– 800 | 38 | 76.9 | 55,665 | 57,887 |
| 800– 900 | 39 | 102.3 | 84,363 | 87,860 |
| 900–1,000 | 30 | 71.5 | 66,116 | 68,169 |
| 1,000–1,200 | 71 | 159.2 | 171,434 | 178,880 |
| 1,200–1,500 | 30 | 79.4 | 99,078 | 106,912 |
| 1,500–2,000 | 32 | 73.1 | 117,402 | 127,780 |
| 2,000–3,000 | 11 | 20.9 | 51,669 | 54,161 |
| 3,000–5,000 | 5 | 13.4 | 42,105 | 44,304 |
| Over 5,000 | ... | .. | .. | .. |
| Total | 650 | 1,662.6 | 1,063,366 | 1,122,708 |

division must be considered very approximate, as relatively small changes in the schedule figures would suffice to throw most of these schedules from the surplus to the deficit class, or vice versa.

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